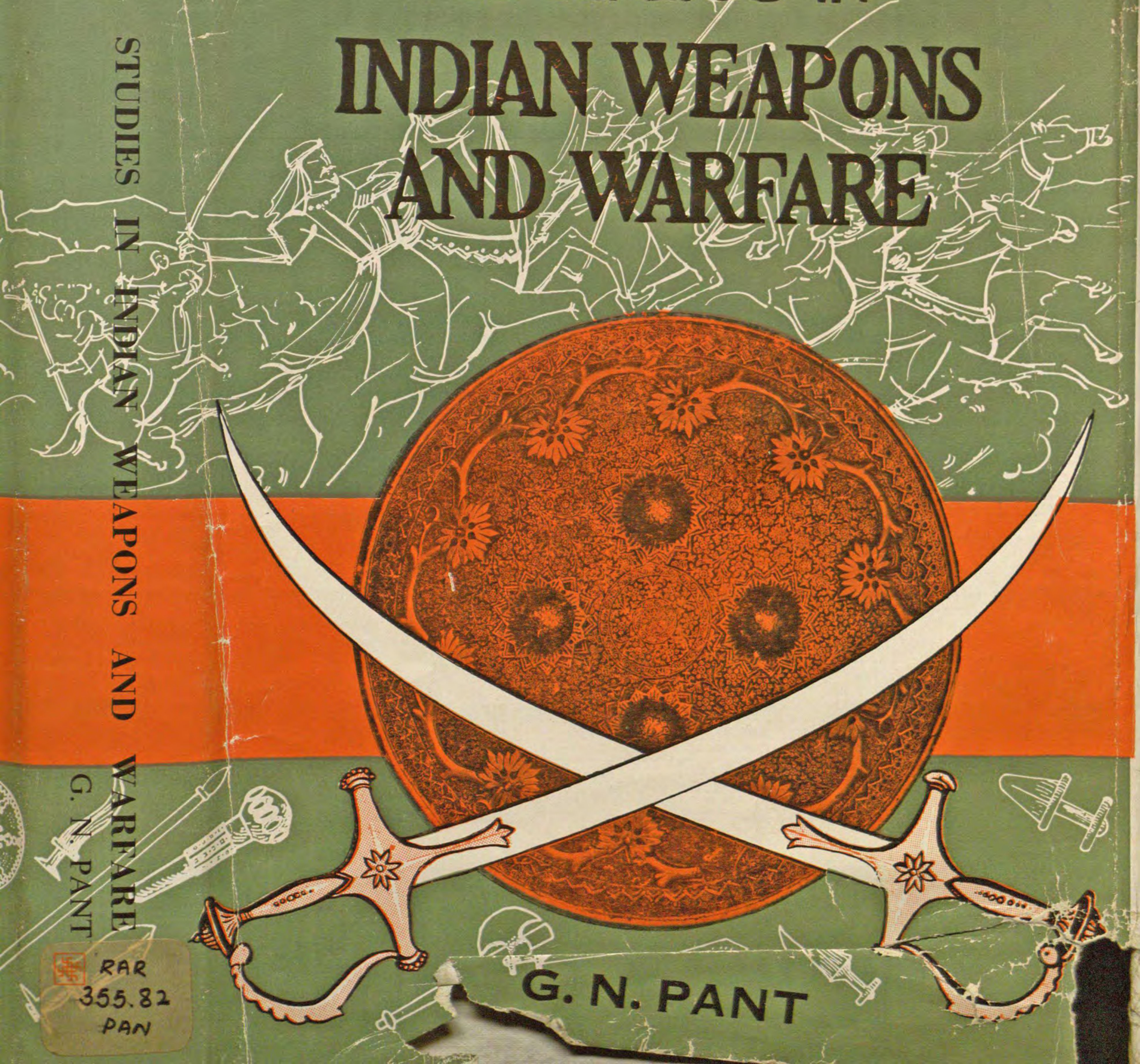
STUDIES IN INDIAN WEAPONS AND WARFARE

G. N. PANT

RAR
355.82
PAN

Studies in
INDIAN WEAPONS AND WARFARE



G. N. PANT

About the book

Indian arms and weapons is an interesting subject intimately connected with the life and history of the Indian people. Even though the subject has been touched upon briefly and in passing by various scholars, no systematic and exhaustive study of Indian arms and weapons through the ages has been attempted so far. As such, the present work is a pioneering attempt. Shri G. N. Pant, a young scholar, being incharge of the Arms Collection, National Museum, New Delhi had the rare opportunity of making a deep study of the subject during the last ten years. This subject is vast and its resource material varied. Pre-historic implements, materials found in archaeological excavations, sculptures-stone, terracotta, bronze and wood, coins, paintings, textiles, ivories, literary and epigraphic evidence, refer to the existence of arms and weapons in India. Deep insight into the available material was necessary to attain mastery over the subject which Shri G. N. Pant has acquired after devoted study. He has personally examined Arms Collections of any consequence spread all over the Museums in India.

The history and development of individual type of arms has been traced out systematically which is of immense value for the understanding of Indian warfare. This pioneering study is of interest not only to the scholars and the professionals but also to the layman and the average reader.

Price Rs. 95.00
$ 27.50
£ 10

STUDIES IN INDIAN WEAPONS AND WARFARE

By

G. N. PANT

Foreword by

GENERAL K. M. CARIAPPA

Army Educational Stores
New Delhi - 5
(INDIA)

First Published 1970

355.82
PAN

All rights reserved with the Publishers for first English edition.

No part of this publication may be reproduced in any form or by any means; electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the Publishers.

SVOE

I.G N.C.A. LIB.
86-613
Deptt of Arts
13-3-86
GOVT. OF INDIA

Published by S Jagmohan Singh for Army Educational Stores, 61/15, Ramjas Road, New Delhi-5,
and Printed at Shobha Printers, East Park Road, New Delhi-5.

नम: पूज्यायै—

SHEELWATI PANT

Who held the lamp to dispel
the darkness of my life and
made me what I am today.

FOREWORD

By

General K. M. Cariappa

Wars of today are "Total Wars". It is not only the soldier, sailor and airman who fight for the defence of one's country on the battle-fields, but every one behind them——be it in a factory or on a farm or driving a bus or a train or doing any such work, is also participating in the conduct of wars. In the last War, it was estimated that for every soldier in the front line at least forty people were behind him, not standing behind him, but in the back areas, providing him his needs of equipment, weapons, ammunition, food, medical facilities, postal services and so on and so forth. So, today, it is imperative that every citizen of the land, as far as possible, should be conversant with the evolution of weapons and arms and their development and with the mechanics of warfare to see how each one can play his/her part in the successful conducting of military operations.

This very fine book "STUDIES IN INDIAN WEAPONS AND WARFARE" by Shri G.N. Pant, is the result of the intensive research carried out by the author with particular reference to weapons and arms and the study of their uses in wars, in our country, from the Vedic periods. He has taken considerable amount of trouble to "dig out" from a large number of important and informative books of reference and other sources, information on this subject for the benefit of our people. I have read this book with great interest with added profit to my knowledge of military matters of old. It is full of educative details on arms and weapons and warfare from ancient days. I hope it will be read widely by every literate Indian and I hope too that every library throughout India will have at least one copy of it as a book of reference for all.

Shri Pant has done a yeoman's service to the public in writing this very militarily educative book.

I congratulate Shri G.N. Pant on writing this very fine book. I hope he will continue to carry out researches of this kind and write similar books to help the study by our people, of arms and weapons and methods of warfare so as to enable them to play their part to build a strong India for the Defence of our Mother Land.

1·2· Jly/69

(K. M. Cariappa)

PREFACE

The present treatise is an attempt to provide for the scholar and the layman a systematic study of the Indian arms and the system of warfare through the ages. It is needless to emphasise the dire necessity of presenting the valuable material in a coherent form, gleaned from the numerous articles and monographs by the author. Subscribing mainly to the desideratum of presenting in a unified form the great wealth of material on this subject, an attempt has been made to shape a cogent story.

History of nations is replete with wars. Arms, weapons and human struggle have gone into their making. It is the man who shaped the weapon as an ingenious device for destruction but the paradox that the weapon has preserved the man is equally predominant. The history of arms and the system of warfare is stretched back to the remote prehistoric times when the arms, not in the modern sense of the term, were weapons of self protection and wars were fought for continued existence. The emergence and evolution of arms and the warfare has to be traced through the ages for their remarkable and resplendent continuity.

The material through the millennia for its study entailed a difficult task fraught with pitfalls. The earlier writings extolled the warrior and brought forth the horrors of war ; the weapons, the means of destruction or preservation, had little attention and were significantly ignored. The departure was imminent and is apparent in this attempt by the author. The origin, the technology, the development and the last but not the least important the use of the weapons, has been traced from the beginning of the invaluable struggle for existence by man.

The author must have inadvertently missed, at times, important points but the helpful suggestions and further researches in the field would definitely help the author to reshape the work, at a later date. It has taken more than a decade to complete the present study ; it is yet a beginning and no doubt a humble one. The effort may serve as a pointer and if it opens an era to be ploughed, the fruit belongs to the posterity.

19th May, 1970.
National Museum, New Delhi.

G. N. PANT

ACKNOWLEDGEMENTS

It is my primary duty to express my heartfelt gratitude to General K. M. Cariappa, who has very kindly gone through my book and honoured the same with his name and foreword.

The author is no less thankful to Lt. Col. J.S. Guleria, Editor-in-chief, Sainik Samachar, New Delhi, for allowing to incorporate author's several articles already published in that journal.

I will be failing in my duties, if I do not mention my thanks to Dr. (Mrs.) Grace Morley who has been an inspiring deity behind the work. She virtually prepared me to do this much. Her continuous care and initiative helped the book grow from stage to stage. The author is also indebted to Padmashri C. Sivaramamurti, renowned scholar and author of many reputed works, for his able and scholarly guidance. This para would be incomplete without the mention of Shri T. R. Gairola for according the much needed and helpful official facilities.

Thanks are also due to Dr. Sachin Roy, for his concrete suggestions and contributions in the chapter 'Tribal Weapons'. Similarly, to Shri S. P. Gupta, for his several suggestions in regard to pre-historic and protohistoric weapons.

Shri Satya Shrava and Shri G.D. Khullar of the National Museum and Shri K. S. Ramachandran of the Archaeological Survey of India helped at times in editing portions of this book and corrected the proofs.

The photographs were prepared by Shri S. P. Nanda and Shri Niyamatullah Shah of the National Museum and the design cover as well as many sketches by Shri A. B. Mankapure of the Audio-visual Department, New Delhi. My best thanks to them.

The author is indebted to his many colleagues in the National Museum of whom Shri R. C. Agrawal, Shri I. D. Mathur, Shri D. Roy Choudhury, Shri V. P. Dwivedi, Dr. B. N. Sharma, Shri O. P. Sharma, Mrs. Krishna Lal, Miss R. Vanaja and Mrs. Shital Puri deserve special mention. The members of the Technical Unit : Shri Jagdish Gupta, Shri Gyan Prakash, Shri Mohan Lal, Shri Ram Swaroop, helped in preparing the index. Shri Bal Krishan and Sardar Ghaninder Singh of the National

Museum and Shri Bhagwat Sahi of the Archaeological Survey of India provided all library facilities ; Miss Chhaya Bhattacharya helped in preparing the bibliography, Miss Manju Goel prepared the layout and Mrs. Kamlesh Gambhir, Shri R. L. Verma and Shri K. P. Nair typed the script.

Sincere thanks are also due to Shri Madan Lal Khosla, Shri A. K. Datta, Shri R. D. Trivedi and Shri Achal Kumar Avasthi for their very sincere and friendly support throughout the work.

In the end the author expresses his gratefulness to Sardar Attar Singh and Shri Janak Arvind of the Army Educational Stores, New Delhi, for taking enormous pains to publish the book.

G. N. Pant

CONTENTS

Foreword V
Preface VII
Acknowledgements IX
List of Plates XIII
List of Sketches XVII

Ch. I Introduction 1
Ch. II Stone Age Tools 7
Ch. III Martial Aspects of the Indus Culture 19
Ch. IV Copper Hoard Weapons 29
Ch. V Archery : Origin and Development 36
Ch. VI Bows and Arrows—Types 55
Ch. VII Archery : Material of the Weapons & Technique 62
Ch. VIII Archery : Operational Methods 66
Ch. IX Mounted Archery 74
Ch. X Archery—a Sacred Game 77
Ch. XI The Indian Sword 80
Ch. XII Representation of Weapons on Ancient Indian Coins 93
Ch. XIII Weapons depicted in Indian Paintings 111
Ch. XIV Decorations on Indian Arms 120

Ch. XV	Arms and Armaments in Kalidasa's Works	136
Ch. XVI	Mughal Arms	150
Ch. XVII	Rajput Arms	177
Ch. XVIII	Maratha Arms	181
Ch. XIX	Sikh Weapons	192
Ch. XX	Antiquity of Fortification in India	212
Ch. XXI	Fortifying the Forts	236
Ch. XXII	Indian Navy	247
Ch. XXIII	Tribal Weapons	257
	Abbreviations	269
	Arms-Collections	270
	Bibliography	272
	Glossary	281
	Index	287

LIST OF PLATES

Plates	*Description*	*Facing page*
I.	Antenna Sword from Shahabad (U.P.).	32
II.	Battle with Bows, Arrows and other weapons, Rajasthan (Painting).	48
III.	Inscribed Metal Bow, Mughal.	62
IV.	Fight Between Yudhisthira and Jayadratha, Terracotta Panel from Ahichchhatra (U.P.).	72
V.	Cavalier armed with Bow, Arrows and other weapons, Rajasthan (Painting).	74
VI.	*Matsya-Bheda*, Mewar (Painting).	78
VII.	Sword-Dance, Mathura, Kushan (Sculpture).	80
VIII.	Curved and Inscribed Rajput Swords, Rajasthan.	82
IX.	Portrait of a Swordsman, Bundi (Painting).	84
X.	Dagger of Aurangzeb, Inscribed Sword of Aurangzeb with *Irani* Hilt, Inscribed *Khanda* of Aurangzeb with Knuckle-guard.	86
XI.	Sword with *Arabi* Hilt, Mughal Sword with *Gilota* Hilt, Delhi.	87
XII.	Tipoo's Sword inlaid with gold, Srirangapatnam.	88
XIII.	Sword of Netaji Subbash Chandra Bose.	89
XIV.	A Battle Scene, Mughal (Painting).	110
XV.	A Battle Scene, Mughal (Painting).	112

XVI. Confronting Warriors, Rajasthan (Painting). 114

XVII. A Rajput warrior with his Sword, Shield and Dagger, Jaipur (Painting). 116

XVIII. Dara Shikoh on the March, Mughal (Painting). 118

XIX. Shahjahan holding a Spear, Mughal (Painting). 120

XX. Shield depicting hunting scenes, Rajasthan. 122

XXI. Decorated Shields of Bamboo, Damascened-steel, Lacquered-work, Gold-plated, Steel, Rhinoceros-skin and Hide. 124

XXII. Jewelled hilt of *Zafar Takiya*, Mughal. 126

XXIII. Ivory inlaid Elephant–Goad, Rajasthan. 126

XXIV. Ivory Gun–powder Flask, Mughal. 128

XXV. Ivory Gun-powder Flask, Mughal. 129

XXVI. Damascened Dagger; Hilt studded with jewels. 130

XXVII. *Śakela* Blade, Rajasthan, *Kirk Naruduban,* Jaipur. 132

XXVIII. Serpentine Swords. 134

XXIX. Shield showing pattern-welding work, South India. 136

XXX. Decorated Shields and Swords. 138

XXXI. *Lakshmana* disfiguring *Surpanakha* with a double-edged Sword, Deogarh, Gupta (Sculpture). 142

XXXII. *Mahishasuramardini* holding a double-edged Sword, Gupta (Sculpture). 143

XXXIII. Inscribed Helmet, Mughal. 154

XXXIV. Mounted Cannon and Muzzle-loading Gun with damascened barrel, Mughal. 156

XXXV. Curved dagger with ivory handle, Delhi, Mughal. 158

XXXVI. Arm and Foot Guards, Mughal. 168

XXXVII. A Mughal Sepoy. 169

XXXVIII. Historical Weapons; Battle-axe of Nadirshah, *Khanda* of Aurangzeb, Sword of Tipoo, Dagger of Aurangzeb. 170

XXXIX. Raja of *Datia* and Soldiers armed with Matchlocks, Datia (Painting). 176

XL. Maharana Pratap as a fully armed warrior, Rajasthan (Painting). 177

XLI. Rajput Armours, Rajasthan. 178

XLII. A Rajput Soldier. 179

XLIII. *Jaghnol,* Rajasthan. 180

XLIV· Equestrian Portrait of a Rajput holding a Spear, Marwar (Painting). 181

XLV. A Maratha Soldier. 186

XLVI. A Hindu Soldier of Maratha Army. 187

XLVII. *Maroo* or *Bhid Chir*, Maratha. 190

XLVIII. A General of Maharaja Ranjit Singh's Army. 192

XLIX. Sepoy of Maharaja Ranjit Singh's Army. 193

L. Royal procession of Raja Sansarchand, Kangra (Painting). 194

LI. Equestrian portrait of Guru Govind Singh ji, Guler (Painting). 196

LII. Sikh Arms. 198

LIII. Sacred Weapons of Guru Govind Singh ji. 199

LIV. Fortress of Uparkot, Junagadh (Gujarat). 232

LV. A folio from *Babarnama* showing a fortified palace, Mughal (Illustrated Manuscript). 238

LVI. Siege of Golconda, Mughal (Painting). 248

LVII. Vijaya's Army crossing the river on Boats, Vakataka, (Wall painting from Ajanta). 250

LVIII. The Mughal Boats from *Babarnama* (Illustrated Manuscript). 252

LIX. An Indian Armada, Pahari (Painting). 254

LIST OF SKETCHES

Sketches	*Description*	*Page*
1.	Arms from the Sanchi bas-relief. Arms from the sculptures at Udaigiri.	2 2
2.	Shouldered-point (Stone-age Tool).	8
3.	Laurel Leaf-point (Stone age Tool).	9
4.	Early Stone Age tools.	13
5.	Middle Stone Age tools.	15
6.	Late Stone Age tools.	16
7.	Indus Valley Stone Arrow-heads.	20
8.	Indus Valley Spear-heads.	23
9.	Indus Valley Weapons.	25
10.	Distribution of Copper Hoards and other bronze & copper implements (Map).	30
11.	Copper-Hoard Weapons.	32
12.	Arrows through the ages.	37
13.	Arrows through the ages.	38
14.	Bows through the ages.	39
15.	Vedic Arrow-heads (Conjectural).	55
16.	Different types of arrows.	59
17.	Quivers.	60

18. Shooting Positions (Standing). 66

19. Pulling of the Bow-string (in a charging pose). 69

20. Pulling of the Bow-string (Stationary). 70

21. Swords through the ages. 81

22. Swords from Miniature Paintings. 86

23. Mughal Swords. 88

24. Weapons on Punch-Marked and Tribal coins. 94

25. Bows and Arrows from Gupta Coins. 97

26. Spears and Swords from Gupta Coins. 100

27. Kanishka holding a Sword. 101
Warrior from Ajanta holding a Sword. 101

28. Swords from Ajanta Paintings. 102

29. Daggers from Ajanta Paintings. 103

30. Spears and Battle-axes from Gupta Coins. 104

31. Weapons from Ajanta Paintings. 113

32. War Scenes from Indian Paintings. 114

33. Rajput Warrior holding a long Spear (Painting). 115

34. Different enamelled, damascened and jewelled Handle 121

35. Knives with handles of precious stones. 122

36. Shields from Ajanta Paintings. 123

37. Decorated Gun-powder Flasks. 124

38. Decorated upper, middle and lower fittings
of the Scabbards. 126

39. Examples of Patterns worked in *Ganga-Jamni* type of mail. 133

40. Parts of the Sword Blade. 152
Parts of the Hilt. 152

41. Battle-axes, Elephant-goad. 157

42. *Jamadharas.* 159

43. Weapons from the original coloured paintings in the manuscript of the *Ain-i-Akbari.* 161

44. Weapons from the original coloured paintings in the manuscript of the *Ain-i-Akbari.* 162

45. Armours. 166

46. Quilted and studded Horse-armour from *Kitab-i-Chingiznama.* 168

47. Armoured Elephant. 169

48. Cannon. 172

49. *Patta*-Swords. 183

50. Spear, Lance with ivory shaft, Lance with wooden shaft, Napier-type spear, *Barachha* and Spear with curved blade. 184

51. Helmet, Arm-Guards and *Char-aina.* 186

52. Muzzle-loading Guns. 188

53. Maratha Arms. 189

54. Citadel of Harappa. 213

55. Fortifications of Rajgir. 221

56, Fortifications of Sisupalgarh. 228

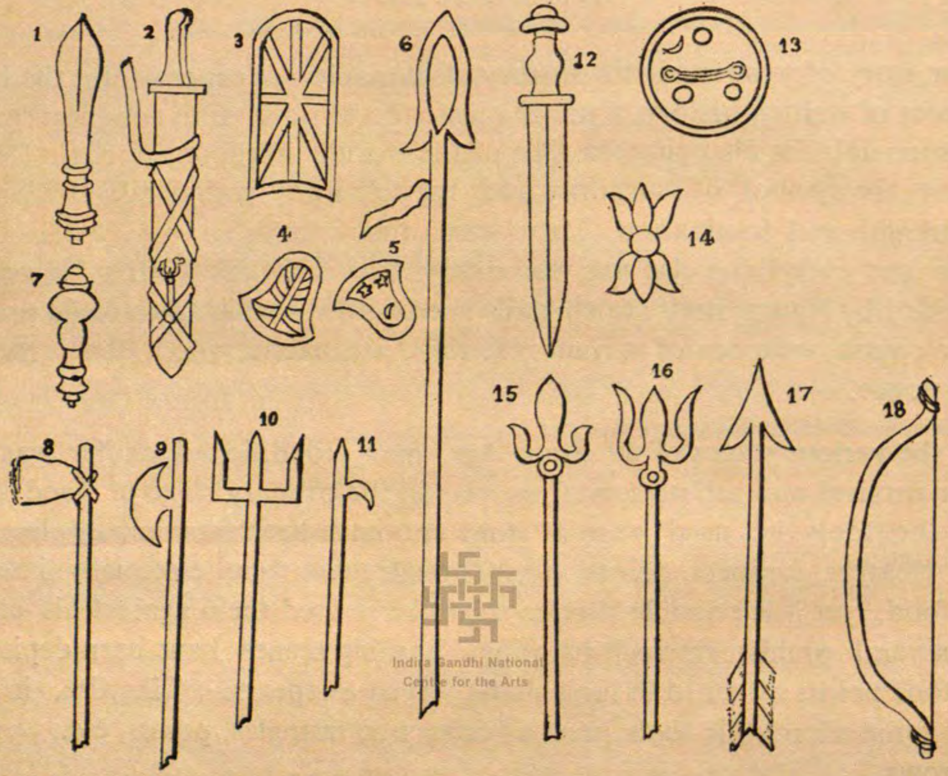
57. Fortified Fort. 236
58. Iron Spikes. 237
59. Plan of Gingee Fort. 238
60. Boats of the Indus Valley. 247
61. Indian Navy through the ages. 250
62. Maratha Ships. 254
63. Tribal Warrior. 257
64. A Militant *Naga*. 259
65. *Naga* holding Spear. 260
66. *Naga* Spears. 261
67. *Adi* Sword. 262
68. *Dao*. 263
69. Warrior carrying *Dao*. 263
70. Tribal Archer. 264
71. Tribal Shield. 266
72. Tribal Helmets. 266
73. *Naga* Chief. 267

INTRODUCTION

The story of weapons is the history of humanity. Weapons form the basis for a certain aspect of written history, a pre-requisite for warfare and conquest and consequently responsible for changing the face of the world. Weapons were the best friends of the brave, the symbol of authority and the token of command ; the visible sign of force, strength and domination. There was a time when these arms attained supreme importance and everything else was secondary. In a sense the earliest weapons were those provided by Nature itself ; teeth, nails and fists with which man could protect himself. In due course, weapons of various materials, viz., stone, wood, bone, metals, etc. came into vogue.

In the various stages of the Stone Age, man, conditioned as he was with the instinct for survival and self-preservation, was in the primary stage of food gathering. Naturally, the tools he used were of stone and have been functionally classified into handaxes, cleavers, scrapers, points, etc. Though these were essentially intended for obtaining food, yet it is possible that he might have used them against his enemies as well. In several prehistoric rock-paintings hunting scenes have been depicted. For hunting, stone points attached to long shafts served as spears. Likewise, in the Late Stone Age, some microlithic tools, such as crescents, triangles, points, etc., were used as tips for arrows.

With the advance of technology, stone was gradually replaced by metal. Thus, in the Indus Culture (2500-1500 B.C.) there is evidence of arrows made of bronze and copper. These were thin and flat with long narrow barbs and no tang resembling the shallow tailed flint arrow-heads of Egypt and Sumer. We can say with authority that stone was being gradually replaced by other materials, largely by metals. In the Vedic literature frequent mention is made of bow. Its mastery was considered so important that a supplementary *Veda*, *Dhanurveda,* is devoted to the Science of War. The Epics, *Puranas*, *Samhitas*, *Smritis*, *Dharmasastras*, etc., are the sources of our knowledge on archery. Three bows have been regarded as supreme, i.e. *Pinaka* of Siva, *Sranga* of *Vishnu*, and *Gandiva* of Arjuna. The first two were made of horn while the last was of bamboo. Arrian and Strabo write about the resting bows on the ground and pressing them with left foot. There was nothing that could resist an Indian archer's shot ; neither a shield, a breastplate nor any other stronger armour could withstand. To Kautilya (3rd cent. B.C.) bows were of four types, i.e. *Karmuka, Dhanusha, Kodanda and Drauna* while arrows six viz., *Venu*, *Sara*, *Salaka*, *Shan*, *Gaudh and Narach*. On numerous Indo-Scythian and Indo-Bactrian coins (2nd cent. B.C.) bows and arrows are represented. King Azes I, Azisiles, Azes II and the Satrap Zeoinises appear as horsemen armed with bow. Bows and arrows together with other weapons could be perceived in the sculptures of Bharhut, Sanchi and Udaigiri where the soldiers in processions are carrying them. The excavation at Taxila has yielded some beautiful examples of 1st cent. A.D. These were leaf-shaped arrow-heads with lozenge cross-section, square, triangular, barbed, ribbed, three-headed and four-headed types. Some interesting arrow-heads of bone and ivory have also come to light. These were of four types : (i) roughly shaped, (ii) globular point (iii) trilateral point, and (iv) with hollow socket.



Arms from the Sanchi bas-relief

(1st Century B.C. : Published by Smith Elder and Co., London)

1. Dagger
2. Sword
3. Infantry Shield
4-5. Cavalry Shields
6. Pike or Javelin
7. *Vajra* or thunderbolt
8. Felling Axe
9. Battleaxe
10. *Trisul* or Trident
11. *Ankush* or Elephant goad.

Arms from the Sculptures at Udaigiri

(A.D. 401)

12. Sword
13. Shield
14. *Vajra*
15-16. Tridents
17. Arrow
18. Bow

A lot of material on archery can be gleaned from the works of the great dramatist-poet Kalidasa which is corroborated by the coinage of the same period. The 'Archer type' is one of the rare types of Samudragupta's coins and it was destined to become most popular in the succeeding reigns and to continue in use till the end of the dynasty.

Contemporary sculptures afford numerous examples. A terracotta plaque (5th century A. D.). from Ahichchhatra (U.P.) depicts a fight with bow and arrow between Yudhistira and Jayadratha The artists of Ajanta and Bagh have also depicted these and in the Ajanta paintings it has been presented not less than twenty times.

Vishnu as *Trivikrama* in the Adi Varaha Cave (7th century A. D.) at Mahabalipuram and in the panels of Mahisasuramardini from the same place (7th century A.D.) and at Ellora (8th century A.D.), Bihar (Pala, 10th century), Orissa (11th century A.D.) usually depict the bow along with other weapons. The bow and arrow was the main weapon of the Arabs. Their 'Naptha' arrows set fire to the 'howdahs' and created disorder among the elephants of Dahir, the ruler of Sindh, in his fight against Muhammad Bin Kasim (8th century A.D.).

The use of the bow continued throughout the Mughal period inspite of the fire arms which were better made and their handling better understood by the soldiers. The Mughal bows were generally four feet long and were double curved. Here we find tiny arrows used in the cross-bow and discharged by an expansive force. These might have, later on, served as the basis for muzzle loading guns in India. The miniature paintings, again, portray bow and arrows.

Indian weapons can be divided functionally into : (i) weapons for slashing or cutting, like the swords, axe, etc. ; (ii) weapons for thrusting like trident, spears, etc. ; (iii) projectiles like arrows, javelins, fire-arms, etc. ; and (iv) weapons for smashing like the mace, etc.

Slashing weapons : The main weapon of this category is the sword. *Khadga* is also a type of sword with a very broad blade. It is usually very heavy and is used for cutting the animals for sacrificial purposes. The '*Dao*' is narrow near the hilt and widens gradually towards the point. The hilt is round, plaited generally with bamboo strips. It is used by the Nagas. The '*Kirch*' is a straight, narrow pointed and double-edged weapon like a sword. It is used for piercing. Somewhat akin to it is the '*Mudairat*' which is curved a little. The '*Parasu*' and the 'Axe' also belong to this variety.

Weapons of thrust : In this family, the most-used and dependable arm is the dagger, the natural weapon of the Indians, who used them generally for thrusting and stabbing. These are both single-edged and double-edged. The most common is the '*Khanjar*' which has sharp edges on both sides of the blade and has a slight curve near the point. It does not have a ridge on the back of the blade. It is usually without a scabbard, and its hilt is very small. The '*Katar*' is a long, straight dagger having sharp edge on one side only. It narrows down towards the point. '*Chhuras* and '*Chhuries*' are ordinary knives. *Bichhwa*' is another type having a curved blade, like the sting of a 'scorpion' and hence its name. The most popular dagger throughout the Mughal period was '*Jamadhar*' with sharpened edges. The hilt is of the English letter 'H' and is formed by two parallel flat iron bars joined by one or two horizontal rods. Sometimes, these *Jamadhars* have two or even three blades and are called *Jamadhar Daulikaneh* and *Jamadhar Trailikaneh* respectively. '*Pesquabj*' is the one having a triangular, flat, pointed blade sharpened at both edges. *Jambiah*, *Khapwah*, curved daggers, daggers with trident were common throughout India in the late medieval period. The *Lahariyadar* dagger of Rajasthan, the *Kris* of Malaya and Singapore, the *Dhas* of Burma were commonly adopted. The handles of daggers were made of soapstone, crystal, ivory, glass, silver and other materials. An interesting sheath for a dagger was entirely of ivory and had several pockets to hold knives and other smaller weapons. Another well-used type, '*Maru*' was the peculiar weapon of the Marathas. It consisted of two double-edged blades serrated at the end. The knuckle had a small spear-head attached to it. The central encasing of the iron hilt had curvilinear designs. *Jafar Takiya* was used by Muhammedans, Marathas and Sikhs alike. This was of a double-edged pointed blade tapering towards the end. The upper end was sometimes made of wooden scroll, coiled like a serpent and sometimes it had a flower bud and an octagonal '*Takiya*' rod. As the name goes, it had its place under a soft pillow for quick and sudden use. Then there were popular *Guptis* of various designs. Walking sticks of several types have been found with blades concealed in them. A *Gupti* could be divided into pieces and sometimes a knife, a pistol, a *chhurra* and a long blade were all assembled into one to make a *Gupti*. Several varieties of 'tridents' commonly known as '*Farasas*' could be distinguished. Double tridents and the trident fitted with pointed rod are variants.

Weapons for smashing: The mace,one of the chief types of this group, is a solid ball with grooves upon it. Sometimes there are spikes all around and a metal rod on the top. It is used for breaking the skull of the enemy. Similar to these were the *Mudgar* and the *Gurj*. The *Zagnol* is shaped like the beak of a bird and is attached to a small pole. This weapon was generally used for cutting the rings of an armour through a heavy blow. It was the special weapon of the Rajputs.

Projectiles: Spears, javelins, *Barchhas* are among others falling in this category. The blades of these weapons are round, triangular, leaf-shaped, octagonal, etc. The spear-head was tied to a long bamboo or stick with a broad blade and was used from the horseback as also hurled upon the foes. The javelins were thin and pointed while the *Barachhas* a single piece throwing weapon of metal, generally used by the cavalry.

Apart from some of the types mentioned above there are numerous varieties peculiar to each region. In the *Pahari* regions *khukari*, *khadga*, scissor-sword, sickle, serrated swords and *trisulas* were popular while among the Marathas, *Baghnakh*, *Ghoonsa* and *Bhidchir* were given importance. The unique weapon of the Sikhs was '*quoits*' (*chakra*) while in south India *ayadkatti*, chopper, and scythe-shaped weapon (*Vicharuval*) have been freely used. NEFA has its own peculiar weapons like the spear with six barbed blade, the *Khamtidha*, a long knife and the cleaver.

A careful examination of the offensive and defensive weapons of the Indus Valley people and the record of Vedic Aryans establishes the superiority of their highly developed technique of warfare. According to Dr. Oppert, Dr. Wilson and Sri Ram Das Sen, the ancient Hindus had the knowledge of manufacturing gun powder. Apart from *Agnipurana*, *Mahabharata*, *Mudra-rakshasha* and other Sanskrit works the *Sukranitisara* makes clear references to gunpowder ; the last also mentions the formula for its preparation. But the first authentic use of fire-arms can definitely be assigned to 1299 A.D., that is, during the siege of Ranathambhore when *Sang-i-Magrabi* (cannon acc. to Dr. R.C. Majumdar) was used. We have authentic information of the use of artillery in the 14th century A.D. It clearly proves that Babar's use of gun powder in Indian warfare is about a century and a half later than its invention in India in about 1400 A.D., if not earlier.

The most common fire-arm was the matchlock commonly known as '*Tufang*' or '*Banduk*', which was chiefly meant for the infantry. The barrel was generally attached to the wooden stock by broad bands of metal or by wires of brass, steel, silver or gold. The second type was '*Jazail*' a swivel gun. These were long matchlocks of various calibres using balls not exceeding a pound in weight and were fired from the backs of camels.

The pistol (*Tamanchah*) was also in use in India as early as the late 17th century, but it was confined to the higher ranks of the nobles. *Sherbachah* (literally tiger cub) musketoon or blunderbuss was a still later introduction.

The general name for the artillery was '*Topkhana*' and the artillery pieces were either horse or bullock drawn. The Mughals were very fond of large guns but such pieces were really, more for show than for use. These guns were given all kinds of fancy names. The heavy pieces frequently lagged behind because of their difficult mobility, consequently they were far behind the army on the march.

Light artillery consisted of small pieces, mostly of brass, each piece mounted on a suitably strong carriage containing two ammunition chests, one behind and the other in front.

Mortars were also one of the items of artillery and formed an integral part of the equipment. A mortar consisted of an iron tube, about a foot long and an inch in diameter, fixed to a bamboo rod 10 to 12 feet long. The tube filled with combustible material when set fire and directed by hand flew like an arrow to a distance of about half a mile.

The Marathas followed the guerilla tactics of hit-and-run raids and, therefore, preferred light armed cavalry supported by swift-footed infantry, which proved irresistible in the age of the Mughals.

With the advent of the British and the French in India fresh impetus was given to fire arms. Weapons were manufactured in foundries and the use of cartridges was ushered in.

It is, however, evident that firearms did not easily fit into the Indian system of warfare and in the 19th century the indigenous army became outmoded, inefficient and the European system was not thoroughly grasped.

Defensive Armour : Indian soldiers also knew how to protect themselves and they had elaborate and comfortable equipment for self-defence. Kautilya in his *Arthasastra* mentions armour for almost every portion of the body. According to Col. Lane Fox, the earliest forms of armour were made of the scales of animals or reptiles. The head was protected by a helmet, generally of steel. A complete suit of armour consisting of coat of mail, pair of arm guards and cuirass with broad belt was also used. The '*Zirh Bakhtar*' made of small iron chains was very popular. Shields were also used for defence purposes.

A word on the technique of warfare will be relevant here. Wars in ancient India, like sports, conformed to specific laws and techniques of marching, encampment, equipment and military arrays. December to March was the most suitable time for expeditions.

The strategic importance of the site was given due consideration. Infantry and cavalry were best directed through forests while chariots were good on plains and elephants on muddy soil The camps were circular, rectangular or square and were divided into nine parts, separated by six roads with parapet walls.

As regards array, four orders were generally followed *Arista*, *Achal*, *Aprathata* and *Madhyabhedi*. Each soldier stood three *angulas* and each elephant 116 *angulas* away from the other Drum, *bheri*, *gomukh* and trumpet were used to declare war and this war music exhilerated the warriors.

STONE AGE TOOLS

"The civilization of India—that is to say of the area now comprising the modern states of India, Pakistan, Ceylon and Nepal—present to the outside observer—be he casual or serious—a number of perplexing contrasts and problems. For example, there is on one hand a sense of overriding unity throughout the whole sweep of her history, and on the other there is a baffling degree of local and regional variation."[1] The whole of the Indian subcontinent is extremely rich in archaeological sites. The remains of pottery, beads, monuments and stone-tools, etc., are scattered throughout its length and breadth.

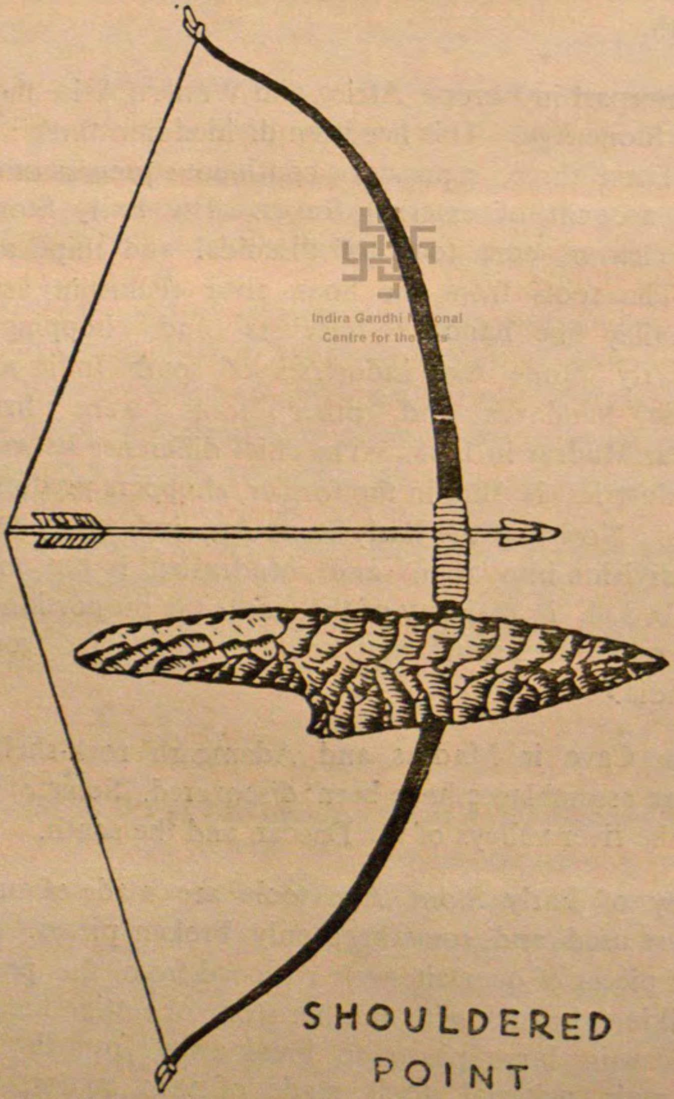
Like its counterpart in Europe, Africa and Western Asia the history of India also started with the Stone Age. This has been divided into three : Early, Middle and Late Stone Ages. These three, represent a continuous process of development with a little difference on account of external forces. The Early Stone Age includes the handaxe industries, cleaver, core tools of discoidal and elliptical outline, chopping tools and flakes. The tools from the Soan river (Pakistan) are crude and heavy. But in its lower valley fine handaxes, cleavers and chopping tools have been discovered. The Early Stone Age industries of south India are often termed as 'Madrasian' because handaxes and other tools were first discovered at 'Attirampakkam' near Madras in 1863. The chief difference between the 'Soan' and the 'Madrasian' industries is that in the former, choppers predominate while in the latter, the handaxes. Now that the Early Stone Age industries have been found all over India and any division into 'Soan' and 'Madrasian' is but arbitrary ; but then, as suggested by B.B. Lal, in majority of the cases the proportion of chopping tools decreases rapidly as one moves south-west, south or south-east from the Punjab into the other parts of India.[2]

At Gudiyam Cave in Madras and Adamgarh rock-shelters in the Narbada Valley also Stone Age assemblages have been discovered. Some of the other important sites are located in the river valleys of the Deccan and the south.

The majority of Early Stone Age tools are made of quartzite. Sometimes, quartzite pebbles were used and sometimes only broken pieces. In order to make tools, large flakes or pieces of quartzite were removed from the parent rock. It was done either by striking the rock with another stone or setting fire, i.e. burning the fire on the rock and so causing large pieces to break away from the main body. Though quartzite was the main material, tools made of vein quartz, volcanic rocks, and various types of crypto-crystalline silica are, though rarely, also available.[3]

It was easier for the Early Stone Age men to prepare cleavers from the quartzite flakes rather than from pebbles or nodules of rock, and once this technique was known their cleavers were made very rapidly and this is the reason that these have been found in large numbers in the later phases of Early Stone Age. Other core tools, generally elliptical and circular in outline, have also been found abundantly. These were also made by the same flaking technique.

At the beginning a stone piece was hit by another stone and a flake was knocked off leaving a concave flake scar with a pronounced bulb of percussion. With the advancement of knowledge the craftsman exercised more control over the material which, in the second stage was held in the left hand and a blow was given to it with a



(after J. Braidwood)

The most characteristic tools of the Middle Stone Age are scrapers. Concave, convex and straight scrapers have been found in large numbers. Round, square or pointed flakes were converted into scrapers with steep retouch. An unusual type has been unearthed from Narmada valley which has the edge worked on the distal end of a thick squarish flake.

The Late Stone Age tools in India gave birth to microliths. The most rich sites are in the plains of Gujarat. During this period small parallel-sided blades were prepared from carefully prepared cores. "The blades are small, and both the scars left upon the cores by their removal are very shallow. Perhaps these blades were struck by a bone or hard wooden point placed on the core and struck with a hammer."[5]

In Central India, Nemkhara and Saliwar, Sakri and Kastara and Barasimla near Jabalpur are some of the notable sites. There are numerous rock-shelters which contain several stone tools besides other things. The tools of this period had become smaller, more delicate and more varied, which definitely proves that these men were more advanced than their immediate predecessors. In the tool assemblage, points and blades are abundant. These have been further sub-divided into many types. In addition to these scrapers, lunates, borers, awls and burins have also been found.

Techniques (Early Stone Age)

Though the prehistoric Man must have used bone, wood, shell and horn for his implements and tools, only the stone has survived the ravages of time and hence the prehistoric archaeology is more or less the study of stone artifacts. The earliest tools were made without the help of any metal implements since metal was unknown. These tools consist of pebbles, one side of which show deep hollows, also known as flake-scars. The tools were made by two methods :

Anvil method :—

This is also called 'Block-on-block' technique. In it a block of stone was struck with all force against the other block which was stationary. The pebble which was to be broken was held in one or both the hands and was hit against the projecting point of a large fixed block of stone or anvil.[6]

Stone-hammer Method :—

This, also known as "direct percussion technique" was the most popular method and has been used all over the world. In it the pebble intended for the tool to be made was kept in the right hand and another in the left hand. When this pebble hit the other a flake was removed. Here the chip came off not from the surface on which the blow was given but from the lower surface. Then the pebble was turned and the blow was given in a similar fashion and the second flake was detached. The block with which it was hit has been called 'hammer.' The size, shape and fineness of the flake depended upon the efficiency and the skill of the man and the angle at which it was hit.[7]

After man had learnt the technique of producing flakes, he began to use these for various other tools. These flakes were acquired by the following methods :

1. Clactonian Technique :—

In this technique a pebble or a nodule was selected which had fairly regular surface. "Having selected such a nodule a blow is given (with another stone) near the edge of one of the flat ended (plain) surfaces. If this blow is well directed and of suitable strength, quite a good flake will be detached. "[8] After the flake was removed the place, technically called 'bulb of percussion,' was surrounded by a series of ripple like rings. This happened because the force given by a blow does not penetrate deep but goes in an ever widening circle. After the first flake was removed there occurred a hollow surface which was always concave (known as "negative bulb of percussion" or "Conchoidal flake scar"). This concave flake scar then served as the platform for detaching other flakes also. While the flakes thus removed were shaped into different tools these left-over cores were used as choppers. Such pieces have been found in the Godavari basin where the core on one side was plain and on the other conical suggesting their use as hammer-stone.

2. Step or Controlled Flaking Technique :—

In this method the maker was required to control the force of his stroke. The pebble to be flaked was taken in one hand (generally in the right) and with hammer in the other hand he hit the pebble. Such a stroke did not penetrate very deep and generally left a step.[9]

3. Cylinder Hammer Technique :—

In this method a cylindrical stone, wood or bone-hammer held in one hand was hit against the pebble in the other hand. Since the hammer is comparatively soft, almost instantaneously force is applied from other points along the rounded surface of the hammer also. Thus instead of a crack spreading from one point and giving rise to a marked bulb of percussion, it spreads from a larger area of contact through a flattened area, resulting in a very flat flake. Leakey has naturally surmised that such tools highly speak of the mental development of the people of that time and of their sense of planning and design.[10]

4. Levallois Technique :—

This technique is named after Levallois Perret, a suburb of Paris, where flakes of this kind were discovered for the first time. In it the core was trimmed and the flakes were removed in such a way that the flake scars met more or less in the centre. Then the blow was given by a sharp and pointed tool and a roughly triangular or oval flake was detached.[11]

5. Mousterian Technique :—

The name has been derived from the cave-site Le Moustier, in France. In this technique, round or polygonal flakes were removed from the core. In this the central surface remained flat and the flakes were removed from all the sides.[12]

TOOL-TYPES

1. Pebble Tools :—

It includes scrapers, choppers and hand-axes in which only the working edge is flaked and the remaining portion is not. Such tools have been found in the western Punjab.

2. Choppers :—

These are unifacial, large and massive; one end was pointed and the base hemispherical.

3. Chopping tools :—

It is made on a core or a split pebble and flaked alternately from both surfaces in such a way that a jagged, wavy, cutting edge results. These were used for chopping wood and meat. These were bifacial and mostly large and heavy.

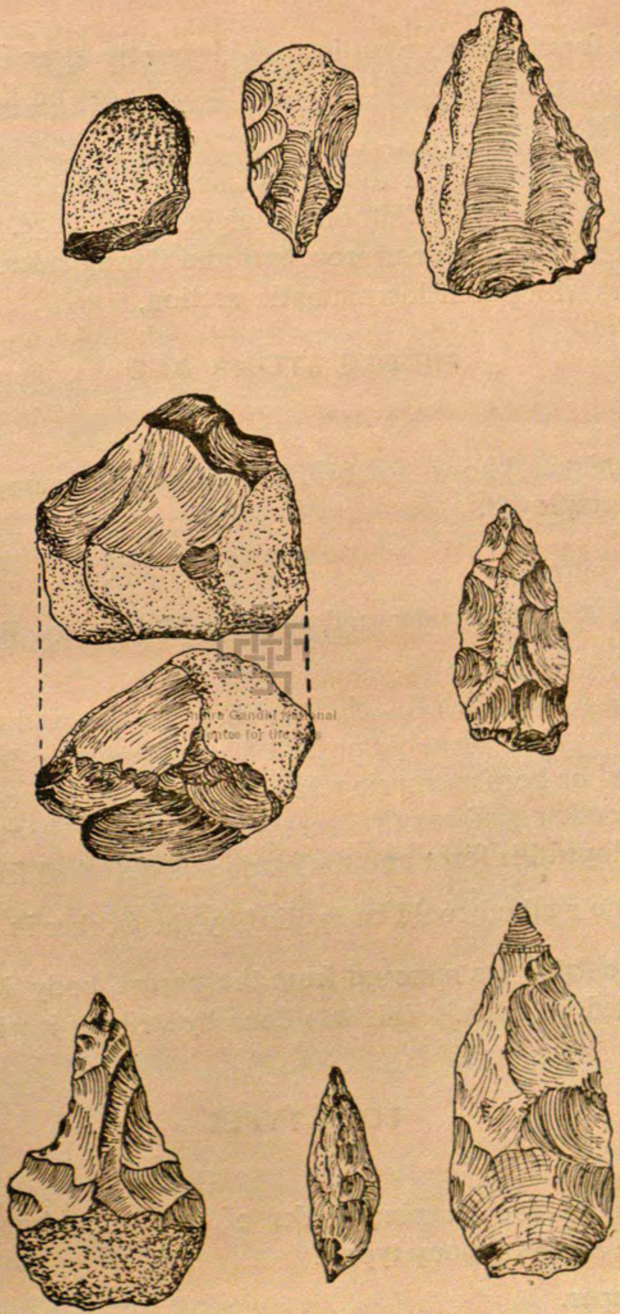
4. Scraper :—

As defined by Dr. Movious the size is the only criterion by which a chopper would be distinguished from a scraper. The latter is smaller in size, generally unifacial, and the unworked side provides a handhold.

5 Handaxes :—

These have further been classified into the following types[13] :—

(a) Pear Shaped	:	It contained flat round butt with a tapering side culminating like a pear.
(b) Triangular	:	Here the surface is flat but sides are triangular.
(c) Oval	:	Like an egg.
(d) Heart shaped	:	Broad round butt with incurved sides like the human heart.
(e) Lance shaped	:	Like leaf or the spear or lance head.
(f) Elongated	:	Flat surface with elongated pointed end.



(after Sankalia)

Early Stone Age Tools

Top : (l. to r.) Pebble tool, unifacial pebble tool, Clactonian flake

Middle : Clactonian type of core, Triangular handaxe

Bottom : Micoquian handaxe, Lanceolate handaxe

6. Cleavers :—

It was used for cleaving or cutting. A cleaver is essentially a tool made on a broad, rectangular or rarely triangular or convex side or end flake. The cleavers may be of the following types :—

(a) Cleaver with square or rounded'U' shaped butt.
(b) Cleaver with pointed butt and straight broad edge.
(c) Cleaver with broad or narrow butt and flaring sides.
(d) Cleavers with parallelogrammatic section.

MIDDLE STONE AGE

Techniques :—

All the techniques known to the Early Stone Age man were used. A few new methods were also employed.

7. Blade Technique :—

Blade means a thick slender and parallel sided flake. Blades are produced by the following methods :

(a) The core from which the blades were to be removed was either partly fixed in the earth and partly raised upwards or held fast between two legs. The worker tied a pointed shaft of wood or horn measuring 2 to 3 inches with a wooden staff. On the either end of the wooden staff was the cross piece. The worker rested his chest against this cross piece, employed his force and the blade was detached from the core below.

(b) The same method could be applied by the worker in a sitting posture.

(c) After the flake was removed from the parent body its edge was further chipped. This is called 'retouch.' This was done by striking it with a small hammer-stone.

TOOL-TYPES

I. Scraper:—

These were used for scraping barks of trees, bamboo shafts or skins of animals. These were again of many types :[14]

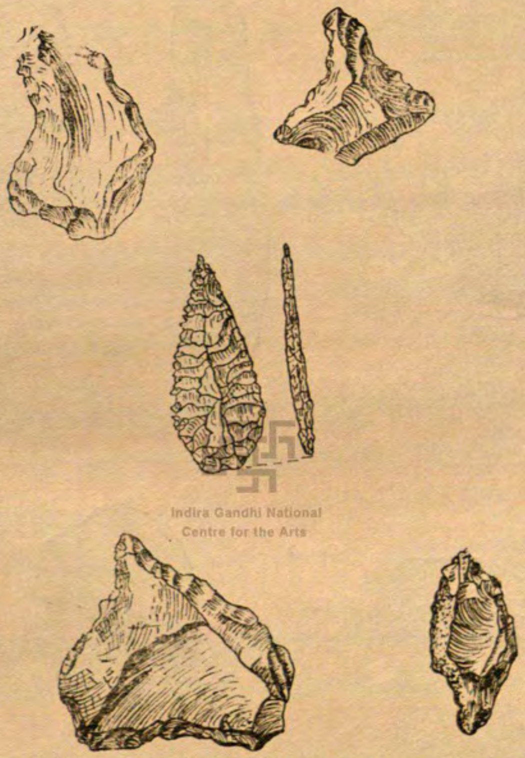
(a) Side scraper.
(b) End scraper.
(c) Round scraper.
(d) Concave scraper.
(e) Convex scraper.

2. Borer-cum-Scraper :—

This was used both for scraping and boring. The upper portion also served the purpose of hand hold.

3. Points :—

Small and thin points have been obtained in large numbers.



(after Sankalia)

Middle Stone Age Tools

Top (l. to r.) : Concave scraper, Borer-cum-scraper
Middle : Bifacial point
Bottom : Awl, Point with an incipient tang

The smaller points served the purpose of arrow-heads while the large ones were used as spear or javelin-heads. The following types have been noticed :—

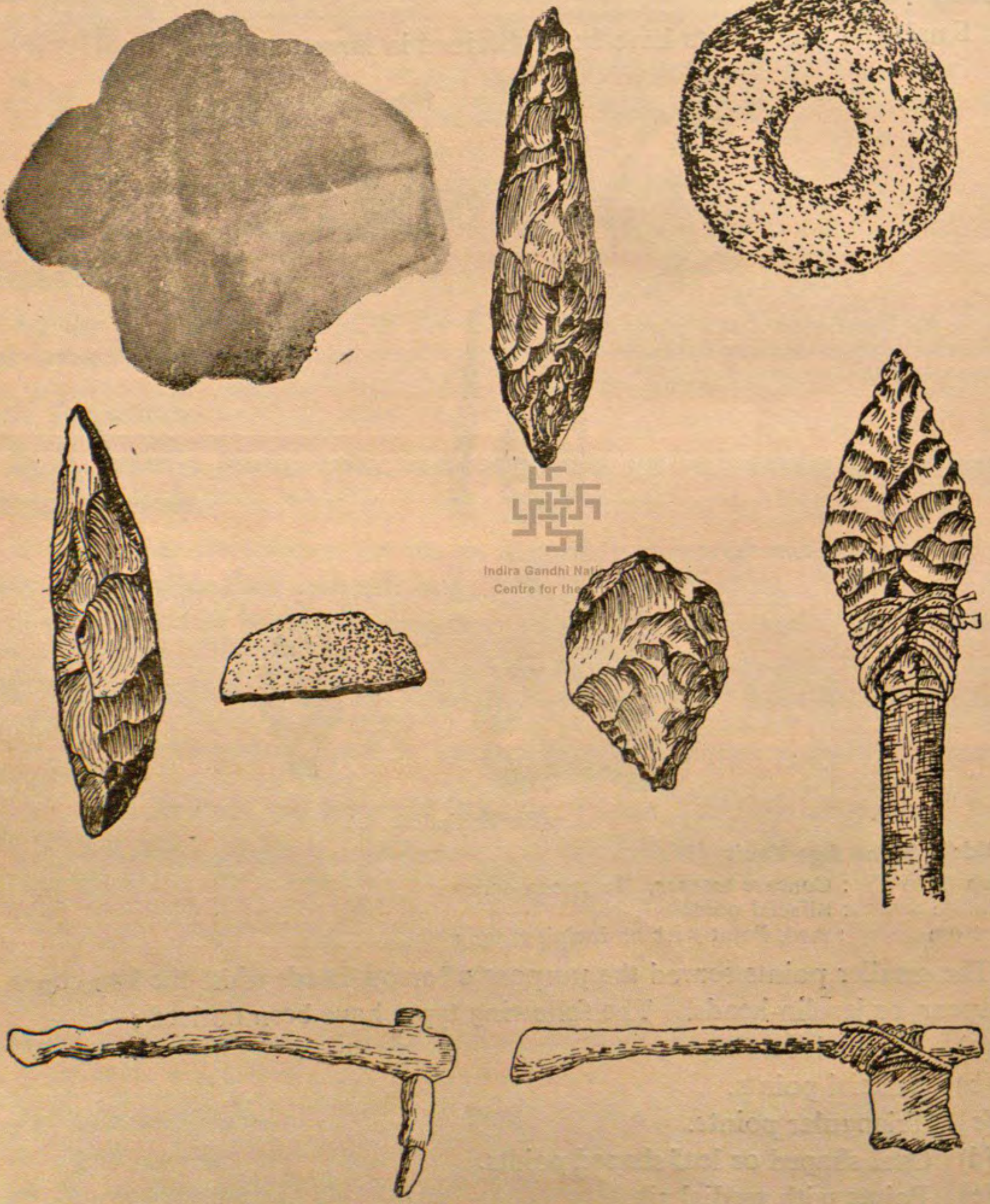
(a) Point with a tang.
(b) Bifacial points.
(c) Triangular points.
(d) Oval shaped or leaf shaped points.
(e) Points with medial rib.

4: Borer or Awl :—

It consisted of a thick, projecting point used for boring. The pointed flakes were carefully retouched and converted into borers,

5. Burin:—

A burin is a small chisel-like tool on a blade-like flake, having a sharp but thick-set cutting edge.



(after Sankalia)

Late Stone Age Tools:—

Top (l. to r.) : Convex edged Stone tool, Ground axe, Macehead
Middle : Cleaver, Muller for grinding, Handaxe, spearhead hafted in a wooden pole
Bottom : Axe inserted in an antler sleeve, Copper axe mounted in a slotted handle

1. Microliths :—

In the Late Stone Age microliths predominate. The word 'microlith' means tiny stone pieces which are made into tools by retouch or secondary working. These were hafted in bone or wooden handles. These are of the following types[15] :—

(a) Single straight edged.
(b) Double straight edged.
(c) Straight with one end pointed.
(d) Crescent shaped.
(e) Triangular.
(f) Trapezoid.
(g) Obiquely blunted.
(h) Hollow based.

2. Micro-Burin :—

This was a special form of a burin on pointed blade. It was a microlith with a burin-like facet.

3. Scraper :—

The scrapers of the Late Stone Age have been classified under the following heads :—

(a) Side scraper.
(b) Steep ended scraper
(c) Concave scraper.

New Stone Age

Grinding and Polishing :

All those weapons which were made by flaking and chipping techniques are naturally coarse and uneven. In the New Stone Age the surfaces of these tools were smoothed and sometimes they shine like a mirror. The pebble or nodule was carefully ground during this age. This is called 'grinding' technique which is seen in almost all the axes, adzes, wedges and chisels of this age, It is not known if some grease or oily substance was used or the object was simply rubbed over a piece of skin till it began to shine. But all these tools bear some sort of 'Polishing'.

Hafting :

The tools, specially the axes were placed in a split wooden haft and bound with leather bands. The hafting could be done in many ways. This hafting-technique continued even up to 3000 B.C.

Tool Types :

The main tool types of this period can be classified as follows[16] :—

1. Celts or axes with (a) pointed, (b) square, (c) rectangular, and (d) rounded butt.

2. Chisels with (a) square, (b) rectangular, and (c) rounded section.
3. Adze.
4. Hammerstone (a) round, (b) squarish, and (c) plano-convex.
5. Ring-stones or mace-heads.
6. Fabricators used as punch for dressing axes and similar ground tools.
7. Choppers.
8. Spear-head type handaxes.
9. Tanged scrapers.
10. Penknife blade.
11. Stone saw.

References

1. Bridget and Raymond Allchin, *The birth of Indian Civilization* (Penguin Books, England, 1968), p. 19.
2. *Ibid.*, p. 60.
3. *Ibid.*, p. 62.
4. *Ibid.*, p. 67.
5. *Ibid.*, p. 79.
6. H.D. Sankalia, *Stone Age Tools* (Poona, 1964), p. 19 and L.S.B. Leakey, *Adam's Ancestors* (London, 1953) pp. 40-41.
7. *Ibid.*, p. 20.
8. *Ibid.*, p. 21.
9. L.S.B Leakey, *A history of technology*, Vol I, p. 136.
10. *Ib id.*, p. 131 and ; H.D. Sankalia, *op. cit.*, p. 25.
11. H.D. Sankalia, *op. cit.* p. 26 and Francois Bordes *L'anthropologie*, Vol. 54 (1950), pp. 21-24.
12. *Ibid.*, p. 29.
13. *Ibid.*, pp. 52-54.
14. *Ibid.*, pp. 61-62.
15. *Ibid.*, pp. 69-74.
16. *Ibid.*, p. 82.

MARTIAL ASPECTS OF THE INDUS CULTURE

The 'Indus' to be precise the 'Harappan' Culture flourished within a time bracket between the third millennium B.C. and the first half of the second millennium B.C. The culture represents a highly organized civic life and as such it is reasonable to expect that they had some sort of military organization, apart from the normal agricultural, trade and other peaceful activities.

According to Mortimer Wheeler "......it is to be supposed that the wide extent of the civilization was initially the product of something forcible than peaceful penetration. True, the military element does not loom large amongst the extant remains but it must be remembered that at present we know almost nothing of the earliest phase of the civilization."[1] Excavations at Harappa, Mohenjo-daro and Kalibangan, the major cities of this culture have brought to light remains of citadels and protective walls ; evidence forcing the inference that the people of this culture were well-guarded against external aggression. Some specimens of weapons have also been unearthed from the Indus cities a study of which would be interesting.

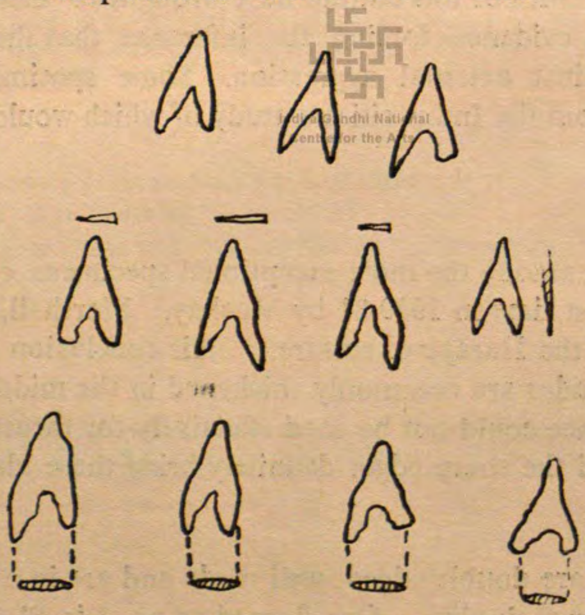
Swords or Dirks :—

The swords are among the most exceptional specimens of this period. These were found for the first time in 1930-31 by Mackay. Marshall, however, believes that there are no swords in the Harappan culture.[2] His conclusion is perhaps, based on the plea that these blades are commonly thickened in the middle and their points are generally blunt, and hence could not be used effectively for thrusting at the enemy. But the general shape and the sharp edges definitely bring these blades closer to the class of swords.

These swords are double edged, well made and are in a better state of preservation, though heavy for their size. One figured as no. 3 in Pl. CXIII of Mackay[3] is a long, narrow, copper weapon found in a hoard. It measures 15.75 ins. in length and the maximum thickness is 0.4 ins. There are two rivet holes at the junction of the tang and the blade. Its blunt edges and point would suggest that it was unfinished. Another No.9 in Pl. CXIX of the same hoard is of copper and 18.5 ins. long and 0.48 ins. thick at the junction of the blade and tang. A stout medial rib runs down the blade on both sides. It is not very heavy and weighs only 1½ pounds. It was perhaps, used for slashing and not for thrusting. A broken copper casting, No. 5 in Pl. CXXVIII of Mackay, is 3.2 ins. long, 1.21 ins. wide and 0.22 ins. thick. It appears to be the point of an unfinished sword. Thus, these three along with another of similar type with a slight median thickening, and diamond-shaped section represent short swords or dirks. These may not have been imported but might have gradually developed from the 'shouldered' or 'flat celts' of the neolithic period.[4] These have been found on the upper levels and have parallels in Syria and Palestine *c.* 2250-750 B.C.

Arrow-heads :—

Excavation in DK area has produced a number of arrow-heads. Mackay's observation, "Their number in this area is perhaps accounted for by the poverty of many of the houses of the Late Period. One would not expect bows and arrows to have been used by the wealthier residents of Mohenjo-daro nor are arrow heads often found in the larger houses,"[5] is not convincing. The bow and arrows is a simple weapon having a continuity from prehistoric times. It is quite probable that being the cheapest and easily available weapon it was popular and was found in the smaller houses which were in all probability in occupation of soldiers and the like.



Indus Valley arrow-heads.
(after Mackay)

These arrow-heads are thin, flat pieces of copper with long narrow barbs and no tang. These were inserted in a split bamboo or wooden shaft. It is impossible to set these heads in the shaft without enclosing a part of the arrow-head into the wood. Mackay observes that the holes were made for this purpose in arrow-heads of almost identical form from Zafer Papoura, Crete.[6] The bronze arrow-heads found at Mycenae have three tie holes for fixing it to the shaft.[7] But these are of later date, However, Egypt and Sumer have not yielded any. Perhaps, the prototype of these metal arrow-heads were the swallow-type flint arrow-heads of the Stone Ages.

The average length of the 'Indus' arrow-head is 1.19 ins., breadth 0.64 ins. and thickness 0.07 ins. These have been found both in the lower and upper levels. All these pieces, more or less, are of one type. Not a single arrow-head of stone has been unearthed. The majority is of copper.

Knives :—

Several specimens have been found in the Indus cities. No sheath has yet been discovered. It is quite possible that the sheaths were made of wood, leather or some such perishable material which have not survived the ravages of time Possibly, these were suspended from the waist by a leather belt and the smaller ones simply slipped into it. In any case, this suggestion is hypothetical and does not have corroborative evidence by way of graphic representation. Mackay has grouped them as follows:[8]

1. Broad leaf-shaped blades

This type is the commonest knife and has been found in numbers. The blade is broad, leaf-shaped, double edged and sufficiently long. Except one which is of bronze No. 5 in Pl. CXX of Mackay all others are made of copper. In another example a copper strip is wrapped round its tang to make it more thick. There is one hole in the tang and the second on the blade which proves that the handle together with the tang enclosed part of the blade also.

2. Leaf shaped blades with curved tips

Only one specimen, (No. 28 in Pl. CXXXIII of Mackay) has been found in full ; the rest being broken. These were more popular in the early age of settlement.

3. Narrow straight knives

These are smaller in size and made of copper. Eight such specimens have been discovered, the largest is 4.19 ins. long. There are indications of their repeated sharpening which would suggest their common use.

4. Triangular knives with upturned points

Two such blades have been discovered from Mohenjo-daro. The tangs of these types are thick and the blades gradually taper towards the edge. These were used for cutting.

5. Broad curved edged knives

Only three such knives, all of copper, and well made have been found. A piece of original wooden handle is still adhering to the tang of one such knife. Since the thickness of this piece of wood is only 0.26 ins. it is possible that separate pieces of wood were used to make the complete handle. The wood was analysed and was found to be *Dalbergia Sisu (Roxb).* It is called '*Yāli*' and was plentiful in the *Shikārgāhs* of the then Sindh.

6. Narrow curved-edged knives

Five such specimens have been found. These vary from 2.82 ins. to 3.65 ins. in length. Only one of them is of bronze and the rest are of copper.

7. Hollow-backed knives

Only one specimen from Mohenjo-daro has been found. It is of copper and has a thick concave back from which it gradually tapers down towards the convex edge.

8. Double-curved knife

Only one specimen of this type has been found having recurved points. It is a peculiar Harappan knife hardly found outside the Indus city. One such example has been reported from Iran. A potsherd from the Great Granary bears the graffitto of a small hafted Knife.[9]

Daggers :—

According to Mackay daggers are of the following types :[10]

1. Knife cum-dagger

The elongated, thinner and double-edged blades must have served the dual purpose of cutting like a knife, and thrusting like a dagger. Four specimens of this type have so far been found ; their lengths ranging between 4.3 ins. and 9.3 ins. One of them bears two rivet holes each 0.09 inch in diameter. One hole at the base of the blade and the second at the end of the tang would naturally suggest that it was rivetted with a wooden haft.

2. Narrow double-edged Daggers

The concave sides of these weapons suggest that these were used for thrusting. These have been found in the earlier levels.

3. Shouldered Daggers

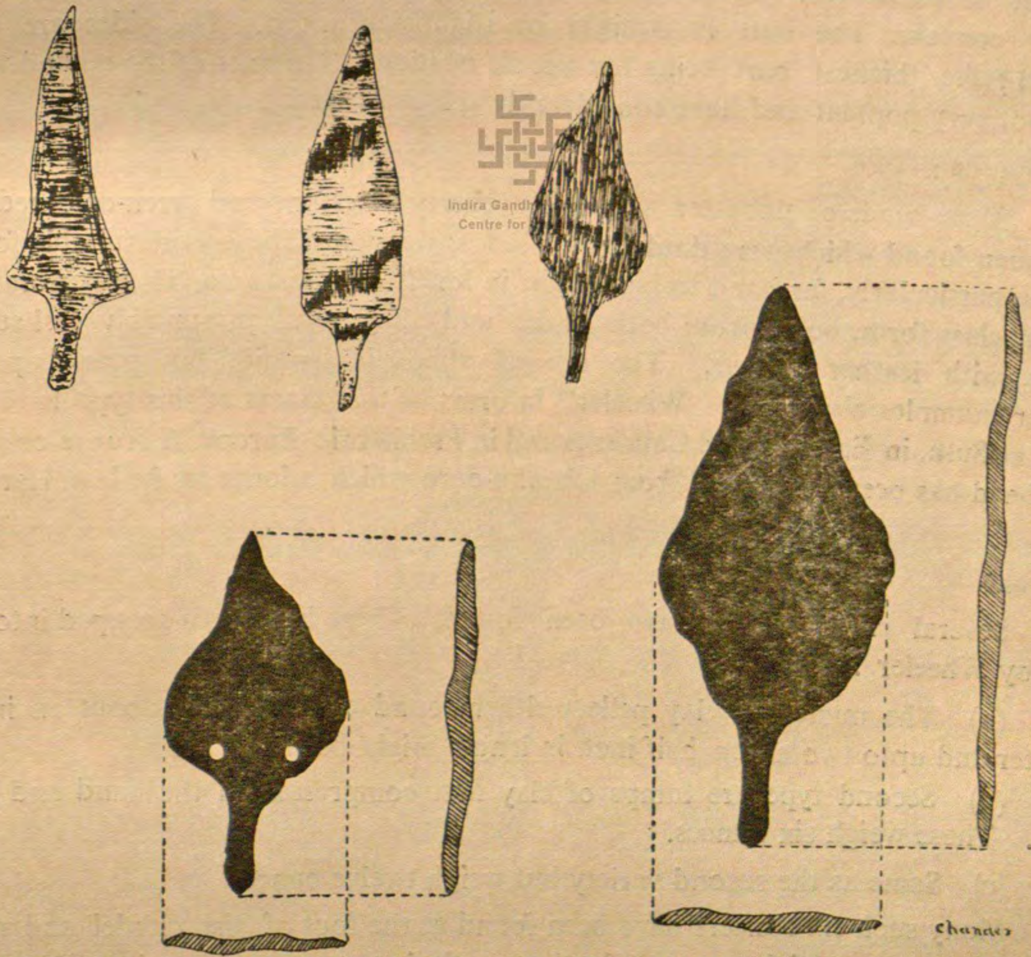
These, mostly of copper, were commonly employed throughout the occupation of the city. The abrupt shoulders of these blades must have withstood considerable pressure.

4. Daggers with mid-rib

Two bronze blades with strong medial ribs have been found.

Spear-heads

The longest spear-head so far found, comes from the SD area and it is of bronze measuring 15·3 ins. in length, breadth 4.8 ins. and thickness 0.15 inch. Two small holes at the bottom of the blade were intended to secure it in a split wooden shaft to strengthen it. Another type 10 ins. long, 3 ins. broad and 0.13 ins. thick has been found but without tie holes. A spear-head which due to its repeated sharpening has become very short and looks like a knife blade (No. 9 in Pl. CXVII) is illustrated by Mackay. The copper spear-head No. 11 in the same plate is 9.1 ins. long. It has a thin well preserved blade and the end of the tang is edged to facilitate insertion into a wooden shaft. The holes on the lower base of the blade are wide apart which suggests that the rib was of considerable width. Petrie[11] has remarked that broad blades in ancient Egypt were used as a kind of long sword for slashing. On the same basis it is quite possible that some of these from the Indus culture were used both for slashing and thrusting.



Indus Valley Spear-heads (after Mackay)

Harappan spears are invariably tanged. Most of them could buckle on impact and must have been strengthened by setting in the split end of shafts. The leaf-shaped spear-head is universal. No barbed blade has been found, although there is a clear illustration of a barbed spear on a Mohenjo-daro seal[12] and a barbed spear-head from Ur could be cited as an instance.

Lance-head :—

The blades are similar to the spear-heads but being smaller in size have been designated as lance-heads. They are more or less triangular in shape. Their average length is 3 to 4 inches. These are double-edged, pointed and made of copper.

Axes :—

These have been classified into : (a) long and narrow and (b) short and broad. The first type has been frequently found. Some of them might have been used as adzes as well. The working end has a crescentic shape and in section it is in double convex. The butt is straight or slightly rounded. The sides are nearly parallel ; the thickest part being the middle portion. The axes of the second variety were not very popular and have considerably splayed edges.

Mace-heads :—

Mace-heads of alabaster, sandstone, cherty limestone and green-coloured stone have been found which were doubtlessly used as weapons. These were suitable for self-defence particularly, for hand to hand fight in lonely or forest area. Their perforation is of hour glass form, bored from both ends, and they were presumably lashed to a handle with leather thongs. The normal shape is lentoid, but pear shaped and circular examples also occur. Wheeler[13] informs us that maces of this type have been found at Susa, in Egypt, in the Caucasus and in Prehistoric Europe. A bronze or copper mace-head has been discovered from Chanhu-daro which belongs to the late Harappan phase.

Missiles : --

Several clay missiles have been found. These have been grouped into three types by Wheeler :[14]

(a) The numerous clay pellets either round or ovoid, are about an inch in diameter and upto two and a half inch in length might be sling-pellets.

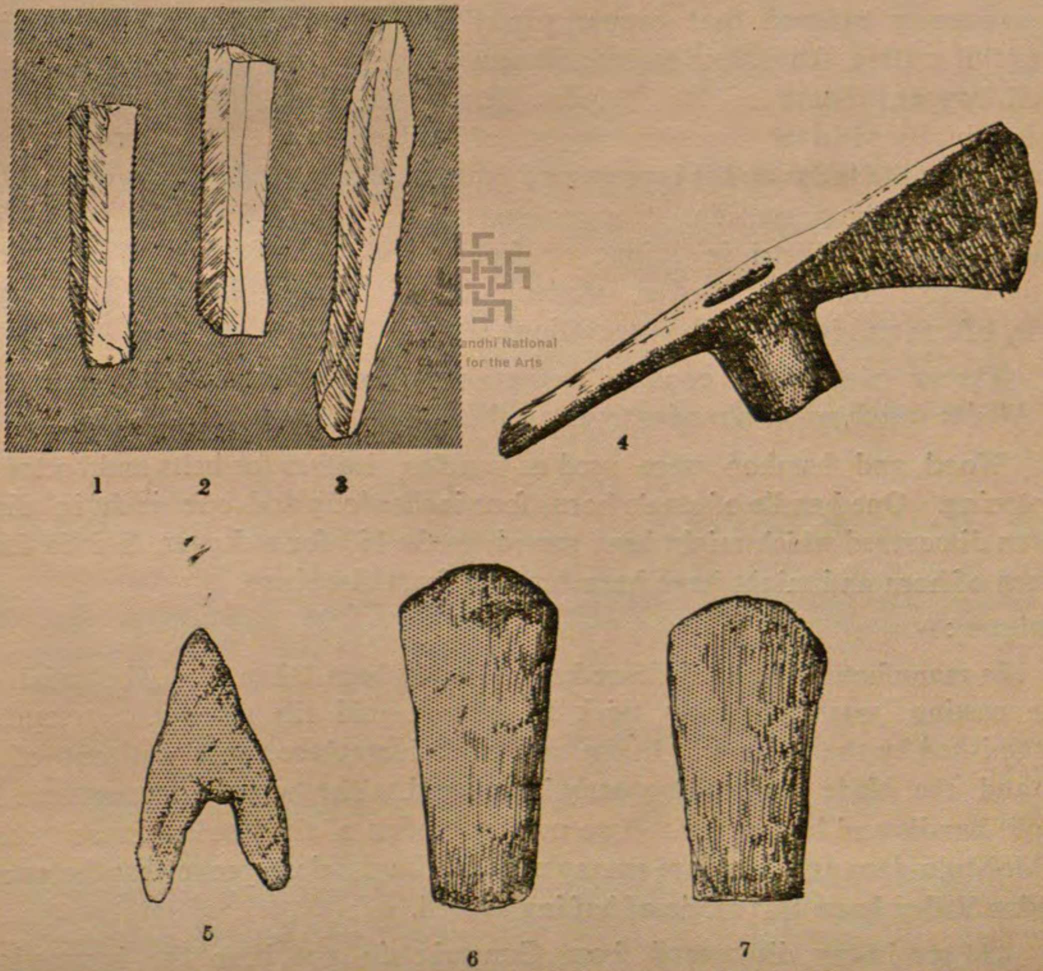
(b) Second type are lumps of clay first compressed in the hand and lightly baked. These weigh six ounces.

(c) Same as the second variety but weigh twelve ounces.

Many such six-ouncers have been found at the foot of the citadel and ninety-eight on the parapet of the tower. Further south, in the same area quite a large hoard of the pottery-balls have been found.[15] Their shape, material and their findspot certainly lead us to believe them to be weapons of offence. The method of use, whether they were thrown by hand or projected from a sling, is not certain.

Armour :—

Several small domed pieces of copper, each perforated with two holes have been found here. These were sewn on to a garment and used as a coat-of-mail.[16] In the National Museum, New Delhi, several such pieces belonging to the 16th-17th century stitched together on a cotton tunic to form a body-armour are preserved. But no other evidence of body armour or helmets has been traced. Shields too are unknown although certain pictographs in the Harappan seals may represent men holding shields.



(after Wheeler)

Indus Valley Weapons

1—3 Parallel-sided Chert Flakes, 4, Axe-adze with shaft-hole, 5, Copper Arrow-head, 6—7, Copper Flat Axes

I G N.C.A. LIB.
86-613
Deptt of Arts
13.3.86
GOVT OF INDIA

Other implements :—

Among the tools and implements found at Harappa and Mohenjo-daro, chisels, celts, axe-adzes and saws account for a larger frequency.[17] Only one example of socketed bronze fragment is known which is remarkable for its technical advance. Razors of four types are known, the commonest being one with a semi-circular edge and with a long handle. The most interesting is the saw. Its cutting edge is semi-circular and has a serrated edge—large, rectangular; roughly flaked stone celts upto ten inches in length were commonly used for cutting. Chert ribbon-flakes separated from prepared cores have also been found.

Material :—

The most abundant metal in the Indus culture is copper. Bronze comes next. It is commonly believed that copper preceded the use of bronze. But the inhabitants of this culture, from their earliest settlement knew the use of a compound of tin and copper. Some of the weapons discovered from Mohenjo-daro contain excessive tin to yield the necessary amount of hardness to it. The sources of tin were far away from the Indus and it is presumed that the people of the Indus cities obtained ready-made tin from outside. Copper must have come from the mines in the neighbourhood of Khetri in Jaipur or from some old workings of Udaipur State. That the copper ore was smelted at Mohenjo-daro is proved by the discovery of a quantity of ore and ingots in the excavations.[18]

The use of stone was confined to the scrapers of the ribbon-flake variety and the chert blades which occur abundantly in all the Harappan sites.

Wood and bamboo were used as handles, leather for belts and cotton ropes for fastening. One handle of stag's horn, four inches long and one inch in diameter has been discovered which might have served, as the hilt for a dagger. This is the only specimen of horn and might have been brought from elsewhere.

Technique :—

In manufacturing swords, care had evidently been taken that the axial centre of the casting was sufficiently thick to form a mid rib when the weapon was finally finished by the hammer. In the case of knives these were cut out of metal sheet and the blade was subsequently hammered. The tanged weapons were hafted to a split handle and bound fast. Two pottery models of shaft-hole axes are recorded from Mohenjo-daro and a bronze example from Chanhu-daro prove that the people of the Indus Valley knew this mode of hafting as well.

424 specimens discovered from Gungeria do not bear the impressions of hammering. It is presumed that after moulding the weapon was hammered and then filed smooth. 'Hones' were used to sharpen the weapons; such hones have been found at Harappa.

Some of the spear-heads bear digits and other inscriptions also.

Apart from the weapons discussed above traces of fortifications have been noticed both at Harappa and Mohenjo-daro. The dockyard of lothal and the clay model of boats reveal their navigational ability. Thus the citizens of the Indus Valley though peace-loving, were fully prepared for their defence.

References

1. Mortimer Wheeler, *The Cambridge History of India,* Supplementary Volume, third edition (1968), p. 72.
2. John Marshall, *Mohenjo-daro and the Indus Valley Civilization,* Vol I (London, 1931), p. 35.
3. E.J.H. Mackay, *Further excavations at Mohenjo-daro,* Vol. II (Delhi, 1938).
4. D.H. Gordon, 'The Early use of Metal in India and Pakistan', *Jour. Roy. Anth. Inst.,* L.XXX (1952), p. 57.
5. E.J.H. Mackay, *op. cit.,* Vol I, p. 461.
6. Hall, *Aegean Archaeology,* p. 251.
7. Wace, *Archaeologia,* Vol. LXXXII, p. 59, Pl. XXX, 38.
8. Mackay, *op. cit.,* p. 462.
9. Mortimer Wheeler, *op. cit,* p. 75.
10. Mackay, *op. cit.,* p. 466.
11. Petrie, *Tools and weapons*
12. Wheeler, *op. cit.,* p. 74 and Mackay, *op. cit.,* p. 336, II, Pl. LXXXVIII, Seal. No. 279.
13. *Ibid.,* p. 76.
14. *Ibid.,*
15. Marshall, *op. cit.,* Vol. II, pp. 465-67, Wheeler, *op. cit.,* p. 76.
16. *Ibid.,* II, 533, III Pl. CXLIII; Mackay, *op. cit.,* p. 54, Pl. CXL, 54 and 66; and Wheeler, *op. cit.,* p. 74.
17. *Ibid.,* p. 506, III, Pl. CXXIX Nos. CCCLXXXIX and CCL, Mackay, *op. cit.,* I, p. 224. and Wheeler, *op. cit.,* p. 74.
18. K.N. Dikshit, *Prehistoric Civilization of the Indus Valley* (1939), p. 53.

For Further Study

1. *Antiquity,* Vols. XIII and XIX.
2. *Archaeological Survey Report,* 1911-12 and 1934-35.
3. *Ancient India,* No. 10 and 11.
4. *Cambridge History of India,* Vol. I.
5. V.G. Childe, *New Light on most ancient East.*
6. *Indian Archaeology*—A Review, 1933-4, 1954-5.

7. F.A. Khan, 'Excavations at Kot Diji' in *Pakistan Archaeology*, No. 2 (Deptt. of Archaeology, Karachi, 1965).
8. D.D. Kosambi, *The Culture and Civilization of Ancient India* (London, 1965).
9. E.J.H. Mackay, *Chanhu-daro Excavations* (1935-6).
10. M G. Majumdar, *Explorations in Sindh*, Memoirs of the Arch. Survey of India, No. 48.
11. S. Piggott, *Prehistoric India* (Pelican Books, Harmondsworth, 1950).
12. M.S. Vats, *Excavations at Harappa* (Delhi).
13. R.E.M. Wheeler, Harappa (1946).
    Ancient India, No. 3 (Delhi, 1947) pp. 58, 130 and *Civilization of the Indus and Beyond*, (London 1966).

COPPER HOARD WEAPONS

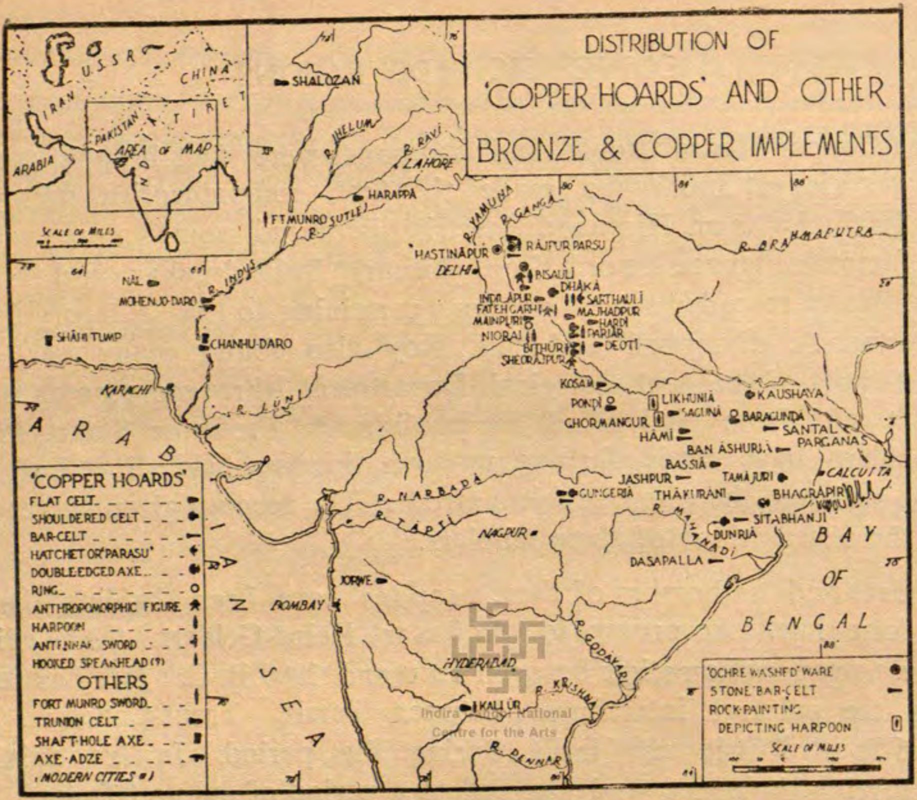
The "Copper Hoard" tools and weapons were first brought to light in 1822 but it was Vincent Smith who made the first comprehensive survey of these weapons in 1905[1]. Later on Hiranand Shastri discovered some more weapons, including the famous antennae sword, from Bithur, Bulandshahar and Hardoi.[2] In 1915 Coggin Brown recorded several weapons pertaining to this category from Bihar, and the next year A. Campbell[3] and S. C. Roy[4] also found many new types. In the Annual Report of the Archaeological Department three more antennae swords, and a few flat celts from Hyderabad are published.[5] Professor Stuart Piggott and R. Heine-Geldern have made further research in the field. B. B. Lal[6] and D. H. Gordon have reviewed the whole problem afresh. The account given here is largely based upon the observations of these scholars.

The date and authorship of these weapons have been baffling the archaeologists for a long time. According to Professor Heine-Geldern the Vedic Aryans produced these weapons sometime between 1200 and 1000 B. C. He has even tried to establish the cultural intercourse between Persia, Trans-Caucasia, Northern Caucasus and South Russia and India during that period. In his opinion, these tools bear foreign influence and also reflect a period of cultural fusion. He says, "If we could hope to find some archaeological traces of the Vedic Aryans it could be among those prehistoric and bronze objects from northern India." Prof. Piggott, however, tried to associate these weapons with the Harappan refugees. He says that "It would be tempting to associate this movement with something more than trade, and to see in it the colonization of Ganges basin by refugees and displaced persons from Punjab and the Indus Valley during the time of break up of the Harappan empire and the coming of the raiders from the West. The deposition of hoards itself suggests a time of insecurity and economic instability, and may mean that invasions gathered momentum and pressed on beyond the old frontiers of the Harappa Kingdom and down into the Ganges Valley."[9]

Unfortunately, none of these weapons have been found in regular excavations, therefore, the date of these weapons cannot be decided with definiteness. However, on the basis of stylistic comparisons and circumstantial evidence these are assigned to the post-Harappan period. Tentatively it can be dated to the early 2nd millennium B. C.

TYPES :

The main types of the so far known tools are as follows :



(after B.B. Lal)

1. Flat Celts :—

These are plain and smooth weapons with upper edge evenly curved. Many sub-types have been noticed in it, among which mention may be made of: (a) Rectangular, (b) Square with slightly concave sides and splayed out cutting edge, (c) both the sides sufficiently curved leaving edges at the corners, and (d) those similar to c, but a little more curved.

These have neither a hole nor a tang. These were perhaps inserted in the split wood or bamboo shaft and used as axes. Their average length is 7 inches, width 5 inches, thickness $\frac{1}{4}$ inches and they weigh 4 lbs.

2. Bar Celts :—

It is a parallel sided bar. Its width ranges from 4 to 6 inches while length from 1 foot 6 inches to 2 feet. Its bottom is flat, section rectangular and upper side convex. The cutting edge is sharpened. B. B. Lal has noticed similar features in some stone bar celts discovered from hilly regions of Bihar, West Bengal and Orissa and says, "There is, therefore, good reason to believe that the copper bar celts developed from their proto-types in stone in course of time when metal began to replace stone."[10] D. H. Gordon, however, differs. In his opinion the stone celts have all the signs of careful workmanship which characterize a stone copy of a metal artifact, and there is little doubt that they are derived from the copper celts and not *vice versa*. "This long narrow tool must have had a peculiar purpose which it served at Chanhu-daro and Nal and possibly elsewhere in that general area during the second half of the 3rd millennium B. C. The Gungeria bar celts are from 12 to 24 inches long, those from Hanin 15 to 24 inches and the probable prototype from Chanhu-daro 10 to 13 inches The stone celts regarded by Lal as being the prototypes are only 8½ inches long, probably the greatest length obtainable in a stone copy, and so unlikely to be the original tool designed to serve the purpose for which length possibly for leverage was necessary".[11] These were certainly used as cleavers although it could have been used in several other ways also.

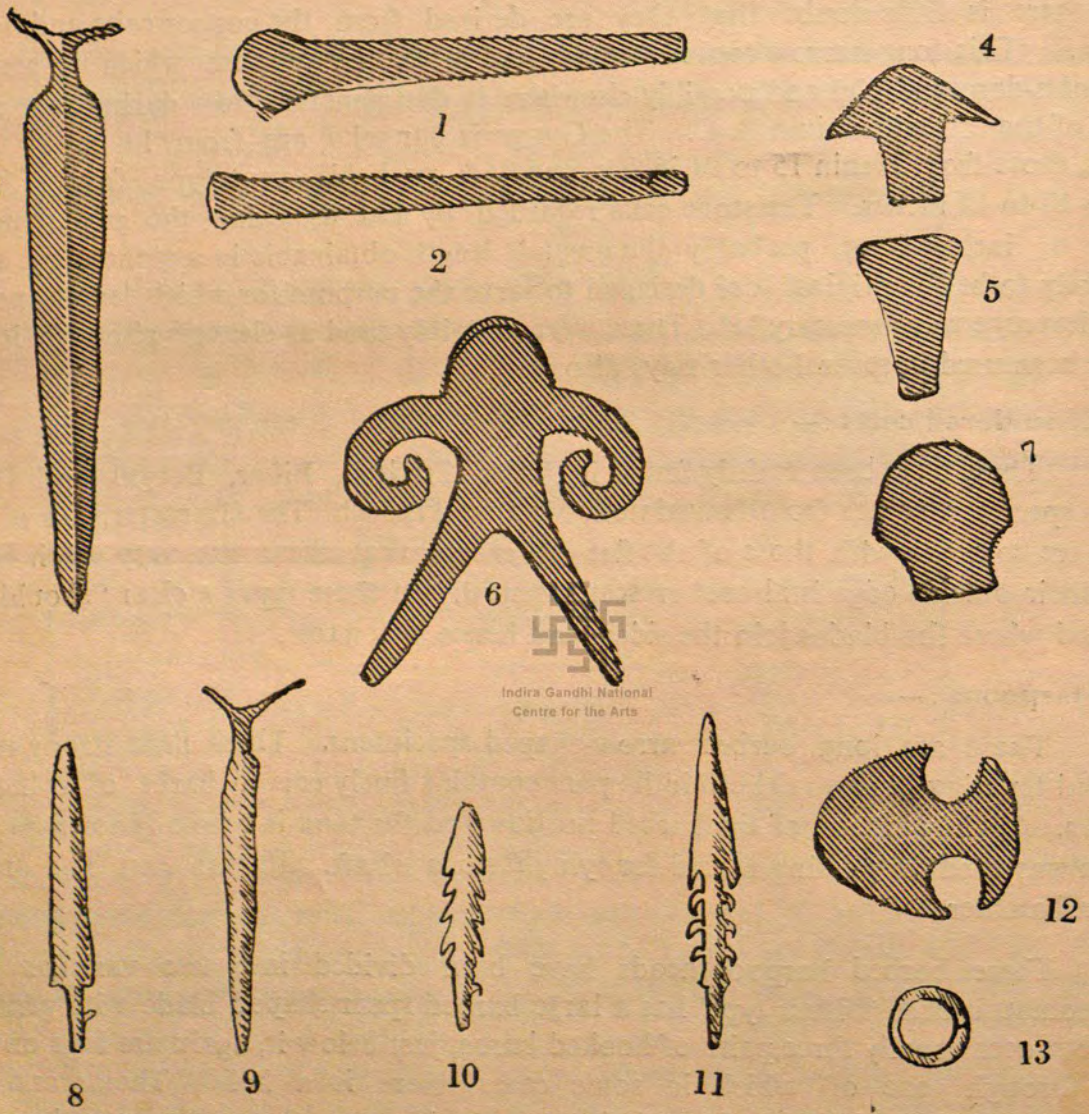
3. Shouldered celts :—

These have been mainly found in Uttar Pradesh, Bihar, Bengal and Orissa. One specimen comes from Navadatoli, Madhya Pradesh. The characteristics of these celts are common with those of the flat celt except that these are very much curved and their outside edge is almost crescent shaped. In these types a clear "shoulder" is formed where the blades join the sides, and hence this name.

4. Harpoons :—

These are long barbed arrow-shaped specimens. These have strong medial rib and tapering blades. The middle part contains finely carved barbs of cylindrical section. At the junction of the barbed portion and the tang is a hole (known as 'eye') which was used for passing a cord for tying it to a shaft. It was cast and finished with a hammer.

These barbed harpoon-heads have been divided into two varieties The commonest called 'Bithur type' has a large barbed spear shaped blade with generally two, but occasionally three,pairs of hooked barbs, just below it, again are lugs on each side, through one of which, in some cases, there is a hole The second type contains a series of barbs, four to six on each side, spaced equally along the whole length of the blade, invariably with a holed lug just above the tang or stem. Most of the harpoons so far available are quite large, with hooked barbs ranging from 12 to 17 inches in length and others from 7½ to 14 inches. These are well-made weapons, cast in a mould of a relatively advanced type with a stout midrib. Gordon has referred to an excellent harpoon, now in the Horniman Museum, which is a fine massive casting of skilled workmanship. Lal's examination of some harpoons from Sarthauli shows that it is possible that the barbs were cut out from the blade by chiselling and trimmed up with a file, though of course, they might have been cast as barbs and sharpened by filing.[12]

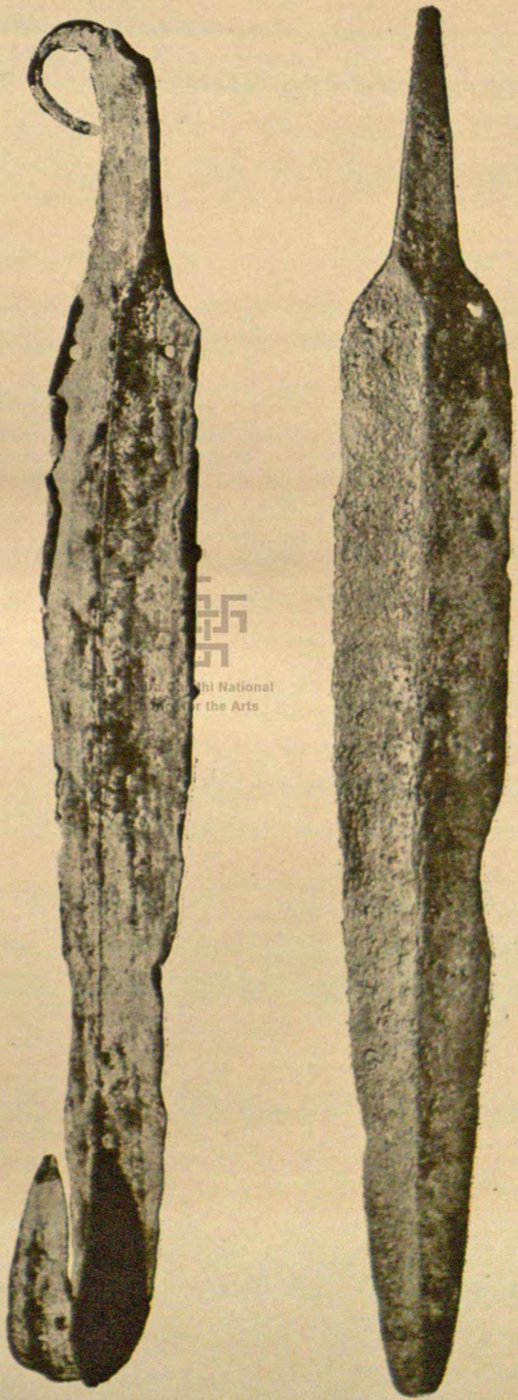


(after Wheeler)

Copper Hoard Weapons

1,2	Bar celts from Gungaria
3,9	Antennae Swords from Fatehgarh
4.	Axe from Sarthauli
5,12	Axe from Gungaria
6.	Anthropomorph (throwing weapon)
7.	Axe from Dunria
8.	Hooked spear from Sarthauli
10,11	Harpoons from Sarthauli
13	Ring from Pandi.

Plate I



hi National
r the Arts

Left : ANTENNAE SWORD FROM SHAHABAD (U. P.)
(C. 2nd. mill. B. C.)
Right : SPEAR-HEAD FROM MOHENJODARO
(C. 2nd mill. B. C.)

Heine-Geldern has tried to prove that these might have originated from the barbed-arrows known from several ancient sites[13], but these harpoons, when judged from their shape and method of hafting are entirely different. These were used like spears. In one of the cave paintings in District Mirzapur, U P., a scene has been painted where several men are trying to kill a rhinoceros. The weapon used by each of them is a long harpoon-headed pole. In another cave painting a man is holding a multiple barbed spear and is trying to kill a *Sambhar*.[14] These harpoons generally have a hole in its tang, which also proves that these were inserted into the bamboo, metal or wooden shafts and used as spears.

5. Antennae swords :

These are long, tapering, double-rapiers with a strong medial rib. The hilt bifurcates like the antennae of an insect ; hence this name. The Gangetic basin and Hyderabad have yielded such swords. Very recently the National Museum has acquired a few specimens of this type from Gujarat. The most surprising thing is that the hilt and the blade are of one cast ; there is no hole in the hilt. However, there is one specimen from Shahabad, U.P., which bears two holes on the blade in the lower portion. This is preserved in the National Museum, New Delhi. B.B.Lal has rightly pointed out that one should not confuse these copper swords with similar other implements found in north-western India. The well known sword from Fort Munro in the Punjab, the Trunion celt from Shalozan in the Kurrane valley, socketed axes from Shahi Tump and Chanhu-Daro and the Adze-axe from Mohenjo-daro do not belong to the Copper Hoards. These are mostly of bronze while the weapons belonging to the 'Copper Hoard' are largely of pure copper. Secondly the 'socket', excepting in the one found from Kurukshetra, is generally absent in the 'Copper Hoard' implements. Thus, writes B.B. Lal, "while the socketed axe, adze-axe, trunion celt and Fort Munro sword etc., with their demonstrable West Asiatic affinities, are likely to have been associated with the upheaval and movement of people that followed the break up of the Harappa culture, the Copper Hoards on the contrary, seem to point to a culture which was mainly confined to the Gangetic basin with a possible southward extension across the Vindhyas and Kaimur ranges".[15]

6 Spear Heads :

D.H. Gordon has mentioned that spear-heads have also been found at various sites. The broad bladed objects found at Fatehgarh, the so called 'Elliot Sword' and the blades discovered at the Niorai, Etawah are all spear heads inspite of their size, which ranges between 20 to 28 inches in length. "These weapons have a projection curving outward from the tang and the same contrivance is found on three out of five spear heads at Sarthauli. The 'Elliot Sword' has all the appearance of a sword but the three examples from Sarthauli with similarly finished tangs are barb headed and must be intended for spears".[16]

7. Dirk :

A hoard of 13 swords and dirks was found at Fatehgarh. At Manpur in the District Bulandshahar, copper dirk 18½ inches long with a midrib has been found together with two axes.

8. Throwing Weapon :

The 'anthropomorphic' figures found at Bisauli, Fatehgarh and Seorajpur have been suggested by B.B. Lal to have been used for religious or utilitarian purpose. It is quite probable that it was an 'all purpose tool' of copper. The curved 'arms' are sharp which was deliberate and not mere accident as suggested by Shri Lal, and could be used for cutting purposes. The comparatively long and blunt 'legs' might have served as a grip. Since these are very heavy, some as heavy as ten pounds or even more, and they might have proved deadly when hurled at close quarters. The intentionally blunted head, hammered into a flanged ridge was most suitable for breaking the skulls of the animals and enemies.

9. Socketed celt :

In 1921 a socketed celt, the only one of its kind so far known, has been unearthed from the site of *Raja Karn Ka Kila*, , near Kurukshetra, Haryana. This is of copper or low-grade bronze.

10. Axes :

Some copper axes have been discovered from Ranchi plateau in Bihar. In a huge hoard at Gungeria four hundred and twenty-four axes together with bar celts have been found. These axes, except the socketed celt, are simple and flat. "Even axes with practically parallel sides having unsplayed edges, ranging from almost straight to semicircular, and others with sides tapering towards the butt and widely splayed edges appear in both areas".[17] Many of them are 7" to 10" long and must have proved effective weapons.

Thus the weapons belonging to 'Copper Hoards' are very individual and uncommon and where parallels have been found, either with the late contemporary of Harappan culture or with its predecessor Stone Age tools, their comparison is superficial and rarely convincing. It is, therefore, in the fitness of things, these weapons are treated in a group and as a separate entity. They certainly add one more chapter to the glorious military history of our country.

References

1. Vincent A. Smith, 'The Copper Age and Pre-historic bronze implements in India,' *Indian Antiquary*, XXXIV (1905), pp. 229-44.
2. H. Shastri, 'Recent additions to our knowledge of the copper age antiquities of the Indian Empire', *Jour.* of the *Asiatic Society of Bengal New Series*, XI (1915), pp. 1–16.
3. A. Campbell, *Jour.* of the *Bihar and Orissa Res. Soc.*, II (1916), pp. 85—86.
4. S.C. Roy, *Ibid.*, pp, 482—83.
5. *Annual Report, Arch Deptt, H. E. H. the Nizam's Dominion* for 1937—40 (Cal. 1942), pp. 22—24.
6. B.B. Lal, 'Further Copper hoard from the Gangetic basin and a review of the problems', *Ancient India.* No. 7 (Jan., 1951), pp. 20–40.
7. D.H. Gordon, *The Pre-historic background of Indian culture*, Bombay, 1960, pp. 135–148.
8. R. Heine-Geldern, *American Institute of Art and Arch.* V, June 1937, p.7.
9. Stuart Piggot, *Pre-historic India*, (1950) p. 238.
10. B.B. Lal, *op. cit.*, p. 32
11. D.H. Gordon, *op. cit.*, p. 142.
12. *Ibid.*, p. 135.
13. Heine-Geldren, *op. cit.*, p. 16.
14. J. Cockburn, 'Cave Drawings in the Kaimur Range, North West Province, *Jour.* of the *Roy Asiatic Soc.* 1899 pp. 89—97, fig. 3
15. B.B. Lal, *op. cit.*, p. 37.
16. D.H. Gordon, *op. cit.*, p. 137.
17. *Ibid.*, p. 135; also G. M Bongad-Levin and D. V. Deopik, 'K Problem Proiskozhdeniya Narodou Munda', [Problem of the Copper Hoard and the Mundas',] (in Russian) *Sovietskaya Etnogragfiya* No. 1 (1957) pp. 46–56 and S.P. Gupta 'Indian Copper hoards...' *The Journal of the Bihar Research Society*, (Jan. to Dec. 1963), Parts I—IV, pp. 147—166.

ARCHERY : ORIGIN AND DEVELOPMENT

धन्वनागा धन्वनाजिं भन्वनातीव्राः समदो जयेम ।
धनुः शत्रोरपकामं कृणोंति धन्वना सर्वाः प्रदिशो जयेम ।।

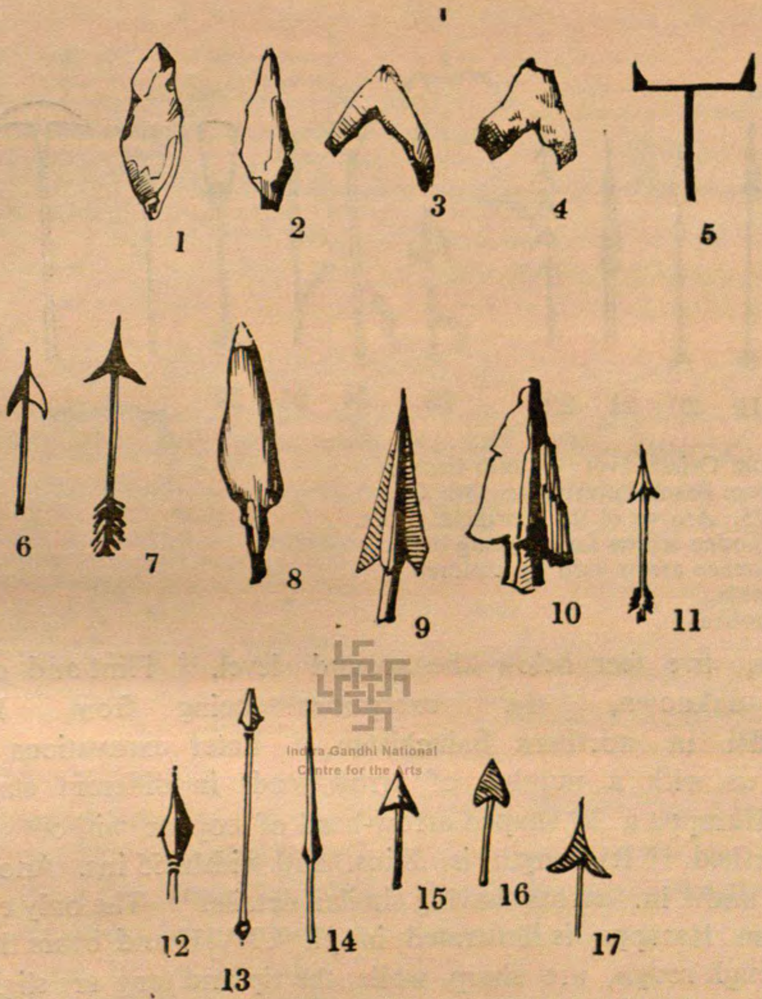
Rigveda

The instinct of self-preservation has been present in man since the dawn of human history. From paleolithic times he has been fighting and defending himself against nature. Earlier contraptions of twigs and slings were followed by bows and arrows. As traditional skill slowly advanced, "coarse chips" were substituted by "flint" arrow-heads (*C.* 20,000 B.C.). Upper Paleolithic (*C.* 16,000 B.C.) hunting tackle was enriched by new inventions and an Indian inhabitant like his counterparts in Africa and Caspian sea regions started employing the bow. The bow and arrow was the first composite mechanism devised by man. In the Neolithic period (*C.* 3,000 B.C.) he no longer content to adapt tools, had the foresight to devise tools for making tools. In addition to tools of wood and stone, bone, ivory and antler were also used.[2] Sharpening, perforation and polishing were the new techniques introduced in the field of archery.

Indus culture

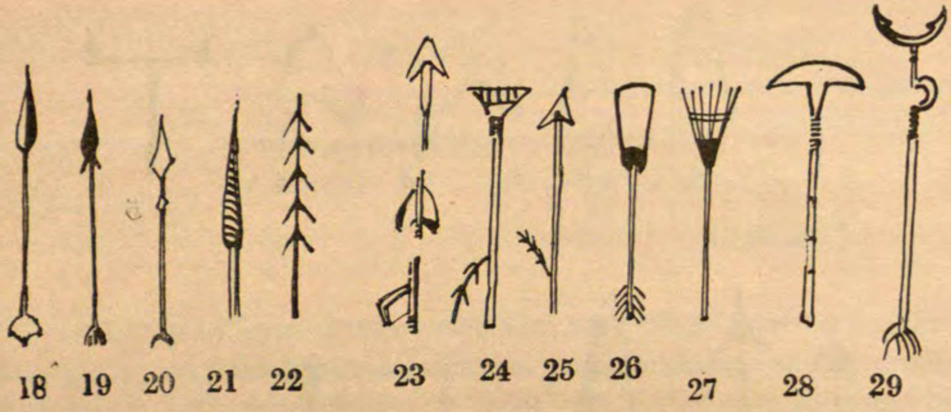
Arrow-heads of copper and bronze are fairly common in the Indus Culture (*C.* 2500 B.C.). They are thin and flat with long narrow barbs and no tang, resembling the "shallow-tailed" flint arrow-heads of Egypt or Summer.[3] The Indian metal-type does not occur in either but is found in Minoan Crete.[4] Arrow-heads of flint or other stone have rarely been found at Mohenjo-daro or Harappa which leads us to believe that the use of stone for this had already become obsolete.[5] Even though the lowest levels have not been excavated due to sub-soil water, "if the stone arrow-heads had been used in the early settlements one would have expected to find stray examples now and then that had been kept from strata no longer accessible."[6]

The specimen, No. 12 illustrated in plate CXLIII of *Mohenjodaro and the Indus Valley Civilization* by John Marshal is the only type of arrow-head having flint proto-type and seems a slight modification of the concave-based flint arrow-head of Egypt,[7] Northern Persia and Western Europe and in the Neolithic and Chalcolithic periods.[8] Metal arrow-heads of this shape are known in early Greece and Caucasus.[9] One such example with a single pointed barb, measuring 1.33 ins. in length and 0.5 ins. in thickness, cut from a copper sheet was unearthed at Mohenjo-daro from



Arrows through the ages

1—2. Prehistoric.
3—4. From Indus Valley.
5. Vedic.
6. From Punch-Marked coins.
7. From Tribal coins.
8. From Taxila excavation.
9—10. From Central Asian Antiquities.
11. From Indo-Persian coin.
12—13. Central India (*c.* 1465 A.D.).
14. From Akbar's Ram-Sita Coin (16th cent.).
15. From Jahangir's Zodaic issue (16th Cent.).
16. From Dilwara Temple (16th Cent.).
17. From Pahari Paintings (*c.* 18th Cent.).

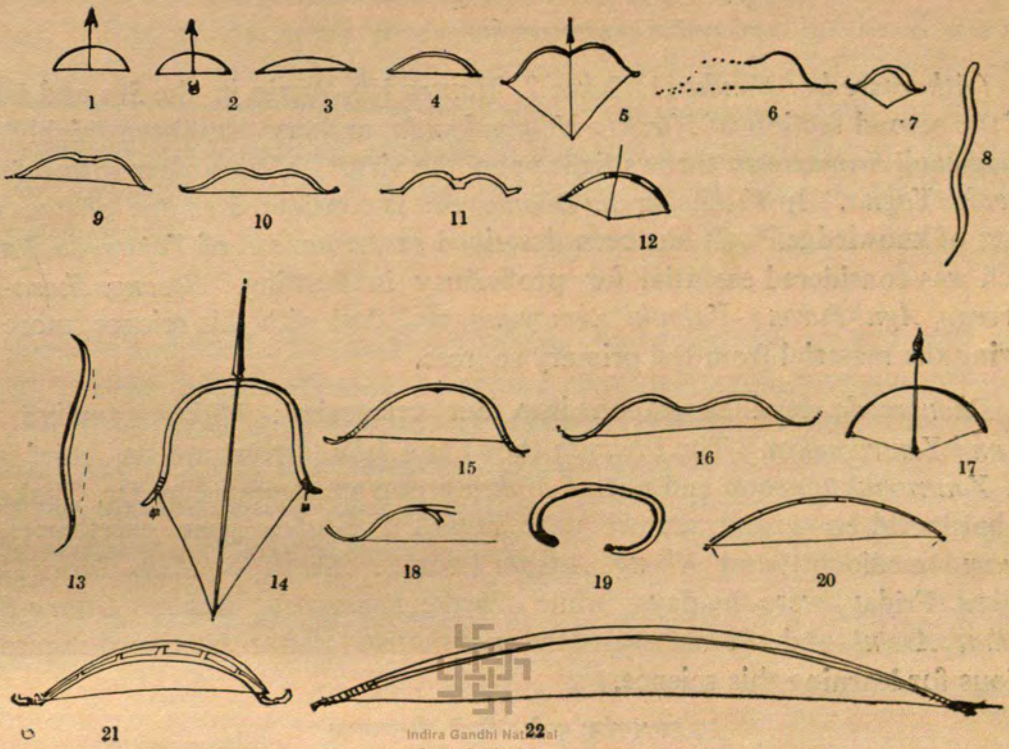


18. From Orissa, Ivory (*c.* 18th Cent.).
19. From Basoli Painting (*c.* 18th Cent.).
20.—25. Arrows of the aboriginal tribes.
26. Wooden arrows for shooting birds.
27. Bamboo arrow used by children.
28. Dohla.
29. Chobha.

the Stupa site, five feet below the ground level.[10] Flint and chert specimens are almost unknown, the exceptions being from Kot-Diji[11] and Periano Ghundai in northern Baluchistan.[12] Later excavations of D K area have provided us with a number of arrow-heads in different states of preservation. Even at Harappa a 'V' shaped arrow-head of copper without tang or socket has been unearthed.[13] Its length is .8 ins. and width .55 ins. Another, No. 14 is 1.25 ins. long and 1 in. across having similar details.[14] The only example of chert arrow-head from Harappa is illustrated in pl. CXVIII and bears the number 4078. The edges, though rough, are sharp while the tip and tang are slightly broken. It measures 1.7 x 0.75 x 0.2 ins. and was found in mound AB.[15] In length the arrow-head of the Indus Culture average 1.19 ins. and in breadth and thickness 0.64 ins. and 0 07 ins. respectively. It is very difficult to discern the difference in the arrow-heads from different levels. These have been found as deep as 22·1 feet below the datum-line but more frequently on the upper strata. It appears that a leaf-shaped piece (pl. CXXVII and CXXI, 18)[16] 1.5 ins. long is definitely an arrow-head. Mackay, however, takes it to be a lance-head. A few blades identified as lance-heads on the basis of shortness may plausibly be taken as arrow-heads.

In the Vedic times

In the Vedic period frequent allusion is made to the bow. Its mastery was considered so important that an exhaustive treatise, *Dhanurveda*, is devoted to the science of war. *Rigveda* refers to bow and arrows quite often. In the second *Mandala* 'Rudra' is praised as the worthy owner of bow and arrow :



Bows through the ages

1—2. From Punch-Marked Coins.
3. From Tribal Coins.
4—6. From Indo-Scythian Coins.
7. From Bharhut Sculpture.
8. From Ikshvaku Sculptures.
9—11. From Gupta Sculptures.
12. From Ajanta Paintings.
13. From Madurai.
14. From Jaina Kalpasutra.
15. From a Painting of 1605 A.D. (Lovers on Camel).
16. From a Painting (Raja Zorawar Singh, 1740 A.D.).
17. From a Painting (Prince Hawking 1755 A.D.).
18. Rajasthan (18th Cent.).
19—21. Tribal (Modern).

अर्हन्विभर्षि सायकानि धन्वार्हन्निष्कं यजतं विश्वरूपम् ।
अर्हन्निदं दयसे विश्वम्भवं न व ओजीये रुद्र त्वदस्ति ॥[17]

In the *Yajurveda* (16th and 17th *adhyaya* on Horse sacrifice) archery has been given an important place. In the eleventh *Kanda* of *Atharvaveda* 'Rudra' is regarded as the killer of enemies with his bow :

धनुर्विभर्षि हरितं हिरण्मयं सहस्त्राघ्नि शतवधं शिखण्डिनम् ।
रुद्रस्येषुश्चरित देवहातिवस्तस्ये नमो यतमस्यां दिशीदूतः ॥

(*Atharvaveda : Kanda* 11, *Sukta* 2, *Mantra* 12). Again in the 5th and 6th chapters of the second section of *Nirukta-Naigamkanda* archery has been highly spoken. *Sankhyayanadi Srautasutra* throws light upon the virtues of an archer with reference to *Asvamedha Yagna*. In *Vishnupurana Dhanurveda* is considered as one of the eighteen branches of knowledge.[19] It has been described as the *upveda* of *Yajurveda*, knowledge of which was considered essential for proficiency in fighting. *Sarangadhara-Paddati, Dhanurveda, Agni-Purana, Valmiki Ramayana*, etc., deal with this science, more or less borrowing the material from the primary sources.

Dhanurveda classifies weapons into four categories : *Mukta, Amukta, Muktamukta and Yantramukta*. The *Dhanush* (bow) and *Ishu* (arrow) are the chief weapons of the *Yantramukta* group and not of *Mukta* group as suggested by Dr. Chakravarti.[20] In the battlefield bows and arrows were regarded *Uttama* (par excellence), *Prasa, Madhyam* (mediocre) and *Khang Adham* (worst). *Surya* (Sunday) *Guru* (Thursday) and *Sukra* (Friday) were the days, while *Hasta, Punarvasu, Rohini, Uttara-Phalguni, Anuradha, Asvini* and *Revati* were the *nakshatras* (lunar asterisms) regarded most auspicious for learning this science.

हस्तपुनर्वसुः पुष्यो रोहिणी चोत्तरात्रयम् ।
अनुराधाश्वनी चैव रेवती दशमी तथा ॥

The entire *Dhanurveda* has been divided into four sections each dealing with the principles, collection, operation, and proficiency in archery.

तत्र चतुष्ट्यपादात्मको धनुर्वेदः यस्य प्रथमे पादे दीक्षाप्रकारः ।
द्वितीये संग्रहः । तृतीये सिद्ध प्रयोगाः । चतुर्थे प्रयोग विषयः ॥

Three bows have been regarded as supreme : *Pinaka*, of Siva, *Saranga* of Narayana and *Gandiva* of Arjuna. The first two were made of horn while the last was of bamboo. Bows were known by different names, such as *Karmuka Kodanda*, etc. In the age of *Rigveda Samhita*, it appears from the term "*sukrt*" and '*ishkara*' that there existed a regular profession of arrow-makers. It is interesting to read in the *Aitereya Brahmana* (600 B.C.) how God fashioned the arrow ; the point of which was 'Agni', the socket 'Soma', the shaft 'Vishnu' and the feathers 'Varuna'. Using butter as the bow the arrow was thrown.[23] In the *Rajasuya* portion of the *Panchika V* mention is made of bow and arrow.[24] According to the *Kautsiki Brahmana* the best type of *dakshina* (fee) is the bow and three arrows. *Nitiprakasika* prefers the bow to be four cubit in length, bent at three places and with a tusk like opening. *Agnipurana* describes that when Indra threw his thunderbolt against Vrtra, the demon, it became separated into four parts i.e. sword, *yupa*, chariot and *sara* (arrow). Because it was broken it came to be so designated. The *Ramayana* speaks of consecrated arrows capable of destroying complete armies by fire or water, and others which produced serpents and many other deadly forms. Rama shot towards Khara arrows of *Agnidiptamukhani* (fire arrows), *Suryamukh* (dazzling arrows) etc.[25] *Ramayana* assigns the invention of bow and arrow along with other weapons to Jaya and Suprabha, the two daughters of Daksha.[26] Vasishtha speaks of a special arrow named *Naracha* made of iron and having five feathers.[27]

Pre-Mauryan Times

Arrian[28] and Strabo[29] write about resting bows on the ground and pressing them with left foot before releasing the arrow. Nothing could resist an Indian archer, neither a shield, a breast-plate nor any other strong armour.[30] Even Curtius says that each chariot was drawn by four horses and carried six men, of whom two were archers; stationed, one on each side, of the vehicle.[31] The bows of the Greek were made of horn, horse-hair and hide;[32] even their arrows might have been more effectively countered by the Indians in 326 B.C., but for the rain-wrought slush under their feet which made it impossible for the Indian archers to get a firm rest for their long bows.[33] Herodotus too, describes the people of Gandhara with bowsof reed and short spear and the Indians as being clad in cotton garments and bearing cane bows with arrows tipped with iron.[34]

Mauryan and Post Mauryan Period

Kautilya (3rd Century B.C.) has given a detailed and systematic account of archery. To him, bows were of four types viz., *Karmuka, Dhanusha, Drauna* and *Kodanda*, while arrows were six, *Venu, Sara, Salaka, Shan, Gaudh* and *Narach.*

Representation of weapons are exceedingly rare on Punch-marked coins. The bow and arrow, with or without taurine symbol are found in two groups. The coins range from 42·5 to 53·5 gms. in weight and their size is in between 0·7 to 45·7[35] in diameter. The second variety of the rare inscribed coin bears a wheel and the bow and arrow. Cunningham has depicted one such coin weighing only 57 grams and bearing an illegible inscription.[36] It is a common type on early Andhra coins from Kolhapur.[37] On numerous Indo-Scythian and Indo-Parthian coins (2nd Century B.C) bows and arrows are noticeable. King Azes I, Azisiles, Azes II[38] and Satrap Zeionises[39] appear as horsemen armed with bow. The principal Scythic dynasties continued to rule in the north while a branch, the Kshaharatras, extended their power in western India and the Deccan. Bhumaka, a Kshtrapa of Kathiawar who preceded Nahpana, issued coins bearing arrow, discus, and thunderbolt. These types can be compared with the certain copper coins struck conjointly by Spalirises and Azes I showing discus, bow and arrow.[40]

The bow and arrow of the Sunga period (1st Cent. B.C.) can be examined in the sculptures of Bharhut and Sanchi. In the sculptural remains of Bharhut[41] (in erstwhile Nagod State) *Stupa*, are found representations of procession of foot soldiers carrying bows and arrows. In the lowest architrave of south gateway of the Great *Stupa* at Sanchi,[42] a battle scene has been beautifully carved and the soldiers are seen attacking the enemy with stones, bows and arrows. Here quivers are also seen filled with arrows of various kinds and tied to the back on the right shoulders of the soldiers.

Bows of the second-third centuries can be studied in the Nagarjunakonda railings of the Andhra period.[43] These bows are long and form a link between the bows of the Mauryan and Gupta periods. A very fine and early bronze of 3rd century A.D. belonging to Ikshvaku dynasty is displayed in the Nagarjunakonda Museum, District Guntur, Andhra Pradesh, which shows a prince (Rama or Siddhartha) standing at ease with a bow in his hand.[44] In one of the pillars from Amaravati *Stupa* (c. 3rd cent. A.D.) we find representation of long bows which can be compared with the representation of the bows in the Orissan caves dated 5th century A.D.

All the arrow-heads found at Taxila are provided with long tangs so that they can be fixed to shafts made of reeds. Since the reed-arrow was generally preferred by Iranian and Central Asian warriors[45] we may reasonably infer that these "double tanged" arrow-heads were an adaptation of the Western socketed type rather than of the Eastern one and it is equally possible that they were introduced in Taxila by the Bactrian Greeks.[46] Apart from "double-tang" the arrow-heads of Taxila have been divided into seven other types by Marshall. He refers to an arrow-head, leaf-shaped with lonzenge cross-section and double-tang (L.2.62, PL. 165, No. 72). The one bearing No. 73 is similar but triangular in shape and that bearing No. 74 is slightly barbed. The one figured as 79 is an arrow-head with triangular cross-section and double tang.[47] Its length is 4·5 ins. Figure No. 80 is with square cross-section and its length is 2·25 ins. Arrow-heads with rhombic cross section, barbed and ribbed-blade etc., are also available.[48] Marshall assigns Nos. 72—7, 80—83 and 85 to the Mauryan period ; No. 84 to the early Saka period ; and Nos. 77, 87 and 88 to the late Saka-Parthian period.[49] He has further indicated that many of these three-headed as well as four-headed types along with others, have been found at the Dharmrajika and other monasteries destroyed by the White Hunas in the 5th cent. A.D. and, therefore, infers that, "It is a reasonable surmise that the former weapons were used by the attacking Hunas, the latter which were traditional at Taxila, by the defending monks, though the three bladed type, which had long been introduced by the Sakas, may also have been used by the defenders."[51]

The excavations at Taxila by Marshall yielded some interesting arrow-heads of bone and ivory belonging to different periods. They are of four types : roughly shaped, with globular point, with hollow socket and with a trilateral point. While the first type was found in Bhir Mound and Sirkap, the rest were confined to Bhir Mound only.[52]

Arrow-heads belonging to Central Asia, were collected by Sir Aurel Stein. Indian influence in the Chinese Turkistan spread through Buddhism and modified by Sassanian influence is reflected in the pottery, textiles and arms. Arrow-heads of worked stones, particularly of chert, belonging to the Stone Ages and Chalcolithic periods have abundantly been found.[53]

Copper and bronze seem to have been used for the making of arrow-heads in preference to stone (2nd-3rd cent. A.D.). Arrow-heads with or without tang, having obtuse points, hollow side and flat head, or concave-sided triangle are found. The edge-line of the blade varies from straight as in *kum. 01* to a beautiful cutting curve as in *Kucha. ·069.*[54] In this type the shaft of the arrow must be fitted with the tapering, hollow stem of the arrow head. *Kum. 01* is an example with an iron tang. The most important use of wood was in making bows and arrows. Fragments of well-made bows are *M. Tagh 03* and *M. Tagh 90017*. Fragments of wooden arrows have been found at many sites—an example is *T. XLIII, 01.*

Gupta Period

Kalidasa in his *Raghuvamsa*, describes Raghu, the hero, as holding a crescent-headed arrow and piercing the bow string of Indra in battle :

ततः प्रकोष्ठे हरिचन्दनाङ्किते प्रमथ्यमानार्णव धीरनादिनीम् ।
रघुः शशांकार्धमुखेन पात्त्रंणा शरासनज्यामलुनाद्विडौजसः ॥[55]

The transition of Parvati from childhood into youth and her eyebrows are compared to the curve of the bow of the *Kamadeva* in "*Kumarasambhava*" :

'कामरयपुष्प व्यतिरिक्रमस्त्रं वाल्यात्परं साध वयः प्रपेदे '[56]
'...........तां वीक्ष्यलीलाचतुरामनंग स्वचापसौन्दर्यमदं मुमोच'[57]

In the battle between Indra and the *asura* Taraka so many arrows were shot that the entire sky was almost pierced by them :

विभिन्नं धन्विनां बाणै व्यथतिमिव विह्वलम् ।
ररास विरसं व्योम रयेन प्रतिवच्छलात ॥[58]

Meghduta mentions five arrows of *Kamadeva* as follows :

"दूरीभूतम् प्रतनुमपि मां पंचवाणः क्षिणोति"[59]

In the *Ritusamhara*, separation from the husband is as painful to the wife as being hit by a poisonous arrow :

"प्रत्युर्वियोग विषदिग्ध शर क्षतानां"[60]

The mere twang of the stretched bow string of Dushyanta was capable of eliminating all worries and what to speak of shooting an arrow :

का कथा बाणसंधाने ज्याशब्दै नैवदूरत: ।
हुंकारेणैव धनुष: सहि विघ्नानपीहृति ।।[61]

The arrow of prince Ayu, son of Vikrama and Urvasi was recognised by the king and *kanchuki* from the name inscribed on it :

उर्वशीसभावास्य मैलसूनोधनुष्मत: ।
कुमारस्यायुषो वाण: प्रहंतुर्द्धि षदायुषाम् ।।[62]

The Gupta period furnishes rich material for a detailed study on archery. The Allahabad Pillar Inscription records that Samudragupta's body was beautified by wound marks of a hundred weapons including battle axes, arrows, swords, etc, which he received during his many victorious wars.

"तस्यविविधसमरशतावतर्णदक्षस्य स्वभुजबलपराक्रमैकबन्धो:
पराक्रमांकस्य परशुशरशंकुशक्तिप्रासासितोमरभिन्दिपालनाराचवैतस्काद्य`क प्रहरण………"[63]

Gupta coins are replete with representation of bows and arrows. The "Archer" type is one of the rare types of Samudragupta's coins, and it was destined to become most popular in the reign of his successors and continued to be used till the end of that dynasty. The king in this type is shown holding an arrow in his right hand and a bow in the left.[64] In the "Tiger-Slayer" type he is again shown stretching the string of his bow to the ear in order to shoot the tiger leaping at him.[65] The "Archer" type of Chandragupta II was issued in large numbers and 798 such coins have been found in the Bayana Hoard of Gupta coins. He usually has a bow in his left hand and an arrow in the right; sometimes this position is reversed.[66] The representation of a quiver is seen in the 11th sub-type of the same series. Both the "Lion Slayer" type, variety "D"[67] and "Horseman" type, variety "C" show bow and arrow. The legend on the "Archer" type of Kumaragupta I has a remarkable reference to archery.[69] The same legend is repeated on Skandgupta's "Archer" type as well. The "Horse-rider" type in gold and the "Archer" type in copper of Kumaragupta I are equally interesting. The coins of Purugupta, Narasimhagupta, Kumaragupta II, Budhagupta, Vishnugupta, Vinayagupta and Prakashaditya contain valuable material for a study on Indian archery.

Examples of this are available in the sculptures of this period. In the Dasavatara temple, Deogarh (5th century A D.), panels showing Rama and Lakshmana in hermitage, Lakshmana disfiguring Surpanakha and Ahalya-redemption contain good specimens[70] of this weapon. A terracotta panel from Ahichchhatra (U.P.) 5th-6th century A.D.,[71] depicts a fight with bow and arrow between Yudhishthira and Jayadratha.

Archery proved to be a great source of inspiration to the artist of Ajanta painting and out of almost two dozen arms, bow and arrow alone has been painted not less than twenty times. Both in cave No.1 and cave No.2 bow and arrow is often painted. Cave No. 17 contains many. In the depiction of *Chhadanta Jataka*,[73] the six-tusked elephant is being watched by a couple. The male figure holds a bow and a sheaf of arrows.[74] The story of *Mahakapi Jataka* shows the Raja of Banaras being escorted by a number of soldiers armed with swords, spears, daggers, bow and arrows. Three soldiers are shooting arrows at the monkeys.[75] In Cave No. 17, the *Sarabha Jataka* is painted where the king with his minister is seen going out for a hunt riding spirited horses and carrying quivers filled with arrows attached to the saddles of both the horses.[76] Shyama while filling water from a lotus pond for his blind old parents was hit by an arrow shot at him by mistake by the Raja of Banaras. Simhala with his army is seen shooting arrows at the forces of Demon. Quivers with arrows are shown attached to one side of the howdah.[77] The quiver, bears a pair of leather straps and is tied to the back of a king who is hearing from his queen the dream story of the golden deer.[78] Archery is best depicted in Pl. LXIX a-b (Yazdani, *Ajanta*) where the hunter, foiled in his attempt to capture the sacred bear, asks his followers to shoot and one of them has drawn his bow and shot an arrow which has struck the body of the bear.[79]

Post-Gupta Times

In the paintings from the Bagh caves, bows and arrows are not altogether missing. Here we find a bow painted blue.[80] On a stone sculpture now preserved in the Batavian Museum, Java, Dharmapala has been depicted holding a bow (c. 8th century A.D.).[81] In a panel at Borobudur, prince Siddhartha is taking part in an archery tournament and competing with other Sakya lords, his cousins and others, for the hand of the fair Yasodhara (c. 8th century A.D.)

The Nagarjuni Hill Cave inscription of Avantivarman similarly states :

"अत्याकृष्टत कुरर विरुतस्पर्धिनः शृंगयन्त्राद वेगाविद्धःप्रवितत गुणादिरितः सौष्ठवेण"

i.e. "He was glittering with the string pulled tight and fitted with an arrow, of the bow drawn upto the extremeties of his shoulders"[82] and in line 8 of the same inscription:

"दूरप्रापि विमथितगजोदभ्रान्त वाजी प्रवीरो वाणेरिस्त्रिव्यासनपदवीदेशिको नन्त नामनाम:"

"The far reaching powerful and scattering the elephants driving horses wild with fear, of him who has the name of *Ananta* impelled with speed and skilfully discharged from the machines of his bow fitted with the well stretched string that is drawn very tight and rivals the scream of an osprey with the noise of its twanging teaches to the wives of his enemies the condition of the sorrow of widowhood."

The Alina Copper Plate of the year 447 of Maitraka Siladitya VII (7th century A.D.) states that the piece of the land of his enemy is upset by his bow and arrows which were forcefully drawn out to the full :

> 'प्रतिपक्ष दर्पपोदय: स्वधनु: प्राप्रभाव परिभूत आश्रतकौशलाभिमान
> सकलनृपतिमंडला: अभिनन्दिता शासनाना:"[83]

Vishnu Trivikrama in Adivaraha cave(7th century A.D.)[84] at Mahabalipuram and panels of *Mahishasuramardini* from Mahabalipuram (7th century A.D.), Ellora[85] (8th century A.D.), Bihar (Pala, 10th century A.D.) and Orissa (11th century A.D.) usually carry the bow along with other weapons. *Tripurantaka* (8th century A.D.) in bronze from the Gautam Sarabhai Collection, Ahmedabad, shows Siva with hands in the attitude of carrying the bow and arrow even though the actual bow is missing.[86] Another bronze showing Rama, Lakshmana, Sita and Hanuman (Early Chola, 11th century A.D.) from District Thanjavur, now in the Government Museum, Madras, is one of the most remarkable Rama groups in bronze. Rama, here is shown as a prince in all his dignity, in an attitude of carrying a bow and arrow.[87] Siva, while slaying Taraka[88] (shown in a panel from Ellora post-Gupta 8th century A.D.) carries a very long bow. The finest representation of bow and arrow is from the Dilwara Temple (12th century A.D. where Chakresvari is holding a bow in her left hand and a barbed arrow pointed downwards in the right. The war-horse at Konarka (13th century) is richly caprisoned with bosses and bands. There is a sheath to hold a small dagger and a quiver with tethered arrows. On a frieze from Bhubaneswar, soldiers equipped with straight swords and long bows are carved. Rama is always portrayed with two hands, the left raised upward to hold the bow and the right hanging down for the arrow. In a late Chola specimen he bears a vaishnavite crown and has behind his right shoulder a quiver of arrows (c. 14th century, Madurai).[90] Similarly a hunting scene from Hampi sculptures (15th-16th cent. A.D.) and dancers carved in marble in the Dilwara temple furnish good examples of both strung and unstrung bows and barbed arrows.[91]

Under the Imperial Kanauj (A.D. 600-650) soldiers carried long spears, shields, swords, bows and arrows.[92] All these weapons of war were sharp and pointed and were in use for ages. Bow and arrow did not undergo material change under the Gurjara-Pratihara (*c.* A.D. 775-1018) and Pala periods (A D. 750-1150). There are illustrations of chariots and armed warriors on a terracotta plaque from Paharpur testifying to the use of bow and arrow.[93] Sankarvarman (A.D. 885-902) who succeeded Avantivarman in Kashmir had a tragic end. After conquering a number of territories on the banks of the Sindhu he was returning through Urasa, District Hazara. Here, in a conflict, a man of low caste struck him with an arrow killing him outright.[94]

Early Medieval Period

Archery was the main weapon of the Arabs and their *Naft* arrows brought disorder in the elephant ranks of Dahir, the ruler of Sind, in his fight against Mohammad Bin

Kasim (8th cent. A.D.) and set fire to the 'howdahs'. The Hindu army was routed and many were massacred Even Rani Bai, the queen of Dahir, hurled stones and rained arrows on the Arabs but all in vain [95] In his battle with Anandpala in A.D 1008 Mahmud Gazni ordered 6000 archers to the front who were opposed by the *Gakhars.* All of a sudden the elephants of Anandpala fled away hearing the noise of "*Naft*" and arrows *(Khadang).*[96] "The Sultan", writes Minhaj-us-Siraj "draw (sic) up in battle array.. ..The light armed horsemen were directed to advance and harass the enemy on all sides with their arrow."[97]

Prithviraj Chauhan is regarded as the most renowned archer and his bard Chand-Bardai in his *Prithviraj Raso* gives him the title of *Shabdbedha.*

In the battle of Chandawar, Rai Jaichanda seated on a lofty 'howdah' received a deadly wound from an arrow and fell from his exalted seat.[98]

Under the Delhi Sultans cavalry was the most valued wing and formed the backbone of the military establishment. Each horseman was armed with two swords, a dagger, a bow and arrow. The archers were known as *Dhanuks,* a corruption of the Sanskrit word *Dhanush* [99]

Farishta mentions that along with *Top, Tufang* and *Gulala-i tufang,* arrows were commonly used by the Deccan Sultans and continued as late as the time of Mohammad Shah of Delhi.[100] In *Mufarrih-ul-Qulub* both the words arrow and bow are found. Sayyid Mohammad Budh alias Sayyed Mir-Alvi had compiled a treatise on archery under the name of *Hadiyatur Rami* for Sultan Alaud-din of Jaunpur (*c.* A.D. 1458).[101] During the period of Iltutmish the cross bow was in use It was a machine discharging balls and arrows by an expansive force. These might have served as the basis for muzzle loading guns used in India at a later stage.

Mughal Period

The use of the bow persisted throughout the Mughal period in spite of fire-arms having become more popular, better made and better handled The Mughal bow was four feet long and was generally shaped in a double curve.[102] In *Zafar-Nama* we find Timur presenting quivers with gold belts. Clavijo tells us that the *Amir,* peopled his capital, Samarkand with master craftsmen including bow makers of all the nations.[103] In 1537, Bahadur Shah of Gujarat declared war by shooting an arrow in the air.[104] Soon after the compromise, Humayun presented his own quiver to Bahadur Shah's Minister.[105] In 1544 Humayun getting in troubles with Shah Tahmasp, marked twelve of his best arrows with his own names and eleven inferior arrows with the name of Shah Tahmasp. Again when Shah Tahmasp forced Humayun to sit on the bare ground, one of his followers tore his quiver open and spread it as a seat for his master.[103] *Taksha Kaman* mentioned in *Ain-i-Akbari* has been defined as a small bow by Blochman, and *Kuman-i-Gurohah* as the pellet-bow.[107] *Kamathah* of *Ain-i-Akbari* is the long bow generally used by the *Bhils*[108] and *Navak* was a pipe through which an arrow was shot[109] Steingass takes *nao* to be a small arrow for shooting birds with a notch on one side and a tube on the other through which the arrow was projected. Such an arrow is described in the list No 15 in the *Ain-i-Akbari.*[110] Its another name *Siham* is found in the *Mirat-i-Ahmedi,* folio 178. A *Tukkah* was an arrow without a head. The National Museum, New Delhi, has in its possession many such arrows of 17th-18th centuries.[111]

In the second battle of Panipat (A D. 1556) an arrow struck the right eye of Hemu, who soon fell down and was captured. A blunt-headed arrow was shot by Adam Shah in anger at his general Zulfiqar Khan on 18th June, 1707. Ten names of the arrows such as *Gherah* (broad headed), *Domuhanah* (barbed) etc, have been described in *Dastur-ul-Insha* (I. p. 228).

Price of an ordinary bow in Akbar's time varied from half a rupee to three *mohurs*; that of an arrow from half a rupee to thirty rupees per bundle; and the value of a *Tarkash* from half a rupee to two *mohurs*. A treatise *Risalah-itir-o-Kaman* of this period prescribes 12 maxims to be obeyed while shooting an arrow.

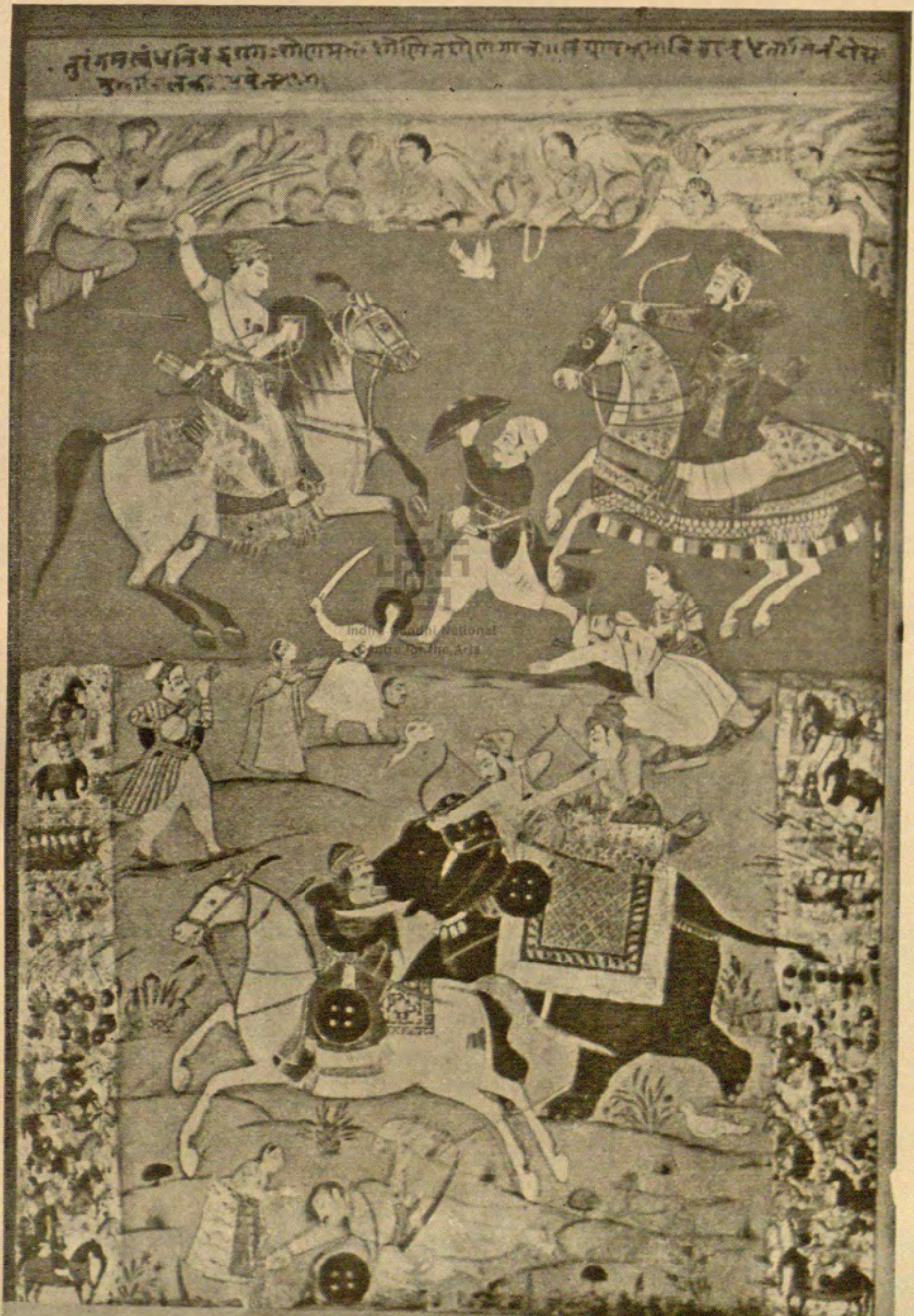
The arrow had a symbolic significance too. Hussain Khan was presented an arrow by the Emperor from his *Khasa* quiver.[113] Roe writes that the best gift for a Mughal Emperor would be "an embroidered bow, quiver and arrows". A bow and arrow was a coveted gift during Aurangzeb's time. A quiver with enamelled fittings was bestowed upon Mustafa Khan and another was presented to prince Mohammad Muazzam, as an evidence of order in their favour. Itikad Khan received a jewelled quiver and a bow and prince Bedar Bakht a jewelled bow and a quiver.[115]

In *Jahankushae Nadiri*[116] written in the year 1151 A.D. a reference to *Charak* may signify a cross bow. The notches at the end were called *Ghoshan* (corner) and the string *Chillah.* (Captain Sinew Williamson informs[117] us that the string was composed of numerous thin catguts laid together without twirling them.

A manuscript copy of Firdausi's *Shahnama* (dated A.D. 1429) contains 21 paintings.[118] Several other references depicting archery can be seen in Indian Miniatures. They are listed below :

(a) A painting from Jaunpur in the Jaina style of about 1465 shows a courtsean, Kosa, dancing on a heap of rice and her lover piercing a mango for procuring it for her with a chain of arrows.[119]

(b) "Crossing of the Ganges by the army of Kublai Khan"[120] of the Mughal School, dated A.D. 1595 and "Lovers on the camel" in Mewar style, dated 1608, contain beautiful specimens of bow and arrows.[121].



BATTLE WITH BOWS, ARROWS AND OTHER WEAPONS, RAJASTHAN, EARLY 18th Cent. A.D.

(c) The *Ramayana* set of about 1610 A.D. of the Mughal period is a treasure house of archery depicting feathered, tethered, three-headed and crescent-headed arrows and bows of several varieties.

(d) "Raja Zorawar of Bikaner" *c.* 1740 is painted as sitting on a prancing steed with his courtiers and one of them is having a bow on his back and quiver attached to the saddle.[122]

(e) In the Kishangarh School of Paintings of *c.* A.D. 1780, Krishna is shown seated, with a lotus in his hand and with his half-brother Balarama in the camp at Kundulpur after abducting Rukmini, the daughter of a local Raja, who was affianced to Sisupala, another king. A quiver full of arrows with three straps is lying near Krishna along with *chakra, sankha, gada* and *padma*. The association of bow and arrow with Krishna is rare in Indian art.[123]

(f) A beautiful example of a lady-archer is seen in the pre-Kangra *kalam* at Guler of *c.* 1755 A.D. where Saki, the queen of Govardhan is riding on a white charger accompanied by a posse of maids. Among the weapons carried by the maids are a matchlock and a bow and arrows.[124]

(g) That horse-archery continued upto the late 18th century can be judged from a painting in the Red Fort Museum of Archaeology depicting "Dara with his army" holding quivers, bows and arrows.[125]

(h) Prithviraj Chauhan has been painted holding a bow in the right and an arrow in his left hand and shooting in the *Garudakrama* pose.[126]

(i) The beautiful creation of the artist Chetu showing "The rape of Yadava woman" of *c.* 19th century shows Arjuna holding his *Gandiva* in a helpless position.[127]

(j) In the numerous paintings of the 19th century also, archery, is often painted. One such example is of a "music party" where a prince is holding his bow and arrow amidst the partymen.[128]

(k) Battle with bows and arrows and other weapons is depicted in a Rajasthani miniature painting datable to the early 18th cent. A.D (PL. II).

It has inspired even the modern painters like Nandlal Bose, and others.[129]

Maratha Period :

The arms and equipment of the Maratha army were of a heterogenous character. While they accepted new arms they did not reject the old ones Consequently, the weapons used by the Maratha soldiers represent all stages of development and some of them were certainly handed down from the early Stone Age.[130] Marathas had excellent slingers and archers. Krishnaji Anant Sabhasad in his book *Life of Shivaji* in 1695 has described the property of the Great Chatrapati and mentions "4000 quiverful arrows". The twang of the string was heard even in A.D. 1761. It is certain that the Afghan Cavalry under Ahmad Shah had more musketeers and archers than were to be found in the Maratha army. In the third battle of Panipat, his adversary Vishwas Rao was struck by an arrow and killed outright.[131] In some of the contemporary Maratha paintings bow and arrow is frequently shown, examples of which are in the collection of the National Museum, New Delhi.

Sikh Period

Sikhs are by nature militant. Guru Govind Singh[132] has given a complete list of Sikh arms, though a great controversy rages regarding their interpretation. Bhai Kahan Singh[133] has mentioned the names of sixty-two arms, along with their sketches, but most of them seem to have been borrowed from the Marathas, Rajputs, Hindus, Mughals and even Europeans Guru Govind Singh and Maharaja Ranjit Singh are often painted holding bow and arrow. Khafi Khan (II·656) has mentioned that slings and arrows were brought by the villagers, who assembled in 1710 for the defence of Jalalabad town against the Sikhs led by Banda Bahadur.

Conclusion :

W. Forbes Mitchell[134] saw bows used by the Indians during the second relief of Lucknow in November, 1857. "In the force defending the Shah Najaf there was a large body of archers on the wall, armed with bows and arrows, which they discharged with great force and precision......one unfortunate man exposed himself a little too long and before he could get down into shelter again, an arrow was sent right through his heart, passing clean through his body and falling on the ground a few yards behind him He leaped about six feet into the air and fell stone-dead".[135]

This was not the last occasion. In 1894 Mrs. Bishop met large number of carts "loaded with new bows and arrows with which to equip the Banner men of the Capital".[136] The *Daily Telegraph* of the 10th November, 1898 describes a *Zihgir* (bow-string holder) which formed a part of Lahore booty to Lord Dalhousie which bears an inscription of Nadir Shah and is dated 1152 A.H.=1739 A.D. Some arrows in the Indian Museum are two feet four inches long. Another arrow as long as 6 feet was obtained from Lucknow in 1857 and must have been used with a very large bow.

The aboriginal tribes of India still maintain a number of weapons both offensive and defensive. The bows and arrows used by them have perhaps not undergone any great material changes even during these hundreds of years

Thus a study of the Indian archery is extremely interesting. The development, types and its existence today will, in all probability, throw light on the deciphering and dating of the Indian paintings and other archaelogical objects. A serious study on its technology and evolution will definitely be of great importance to the scholars.

References

1. Gordon Childe, *What happened in History* (Pelican Book) p. 27.
2. *Ibid.*, p. 38.
3. Sir Mortimer Wheeler, *Indus Civilization*, The Cambridge History of India Vol. I, p. 57.
4. E.J. Mackay, *Further Excavation at Mohenjodaro*, Vol. I, p. 461.
5. *Ibid.*
6. *Ibid.*
7. Brunton and Caton Thompson, *The Badarian Civilization*, pl. LXXXIII.
8. John Marshall, *Mohenjodaro and the Indus Civilization*, Vol. II, p. 499.
9. Petrie, *Tools and weapons* p. 35 and Glotz, *Agean Civilization* p. 90.
10. John Marshall, *op. cit*, Vol. II, p. 499.
11. Wheeler, *op. cit.*, p. 57.
12. A. Stein, *An Archaeological tour in Afghanistan and Northern Baluchistan*, Memoirs of the Archaeological Survey of India No. 37, p. 40,
13. Madho Sarup Vats, *Excavation at Harappa*, Vol. I, p. 391 *and* Pl. No. 13.
14. *Ibid.*, p. 391.
15. *Ibid.*, p. 391.
16. Mackay, *Further Excavations at Mohenjodaro*, I p. 461.
17. Rigveda, ii, 33, 10 and Macdonell, *A Vedic reader for students*. 1957, p. 61.
18. *Atharvaveda Samhita,4/4/16*, and also *4/30/15, 5th, 6th, 7th, 11th and 15th Kandas.*
19. *Vishnuparana*, Wilson's translation, VIII. 67.
20. P.C. Chakravarti, *Art of war in Ancient India* (Under bows and arrows)
21. *Dhanurveda Samhita*, Verse 10. (Saka 1840)
22. Khemraj Srikrishnadas Shreetina, *Dhanurveda Samhita*, verse 2. (Courtesy : Shri Ram Dass Sharma, Alwar).
23. P.C. Chakravarti, *op. cit.*
24. *Ibid.*
25. Valmiki *Ramayana*, *Aranyakanda*, *sarga* 29.
26. *Ibid.*, *Balakanda*, *Sarga* 22.
27. *Indian Historical Quarterly*, VII, p. 707.
28. Indica of Arrian (Mc Crindle), p. 16.
29. Strabo, XV, 66.
30. Arrian, *op. cit.*, Chap. XVI.
31. Q. Curtius VIII, 14, *Megasthanes* Frag. XXXV.
32. *The Tutorial history of Greece*, p. 336-7.
33. E.J. Rapson, *Cambridge History of India*, Vol. I, (1955), p. 328.
34. H.C. Roy Chowdhary, *Political History of Ancient India*, (1953), p. 242.
35. J. Allan, *Coins of Ancient India*, pl. XXXII.
36. A. Cunningham, *Coins of Ancient India*, pp. 60-61, (pl. III, fig. 14)
37. E.J. Rapson, *C.A.W.K.* pp. 5-9, pl. 1-4.
38. V.A. Smith, *C.C.I.M.C.* pp.43-44
39. Percy Gardiner, *The coins of the Greeks and Scythian Kings of Bactria and India in the British Museum*, pls. XX3, XIX, 4.
40. H.C. Roy Chowdhary, *Political History of Ancient India*, p. 484.

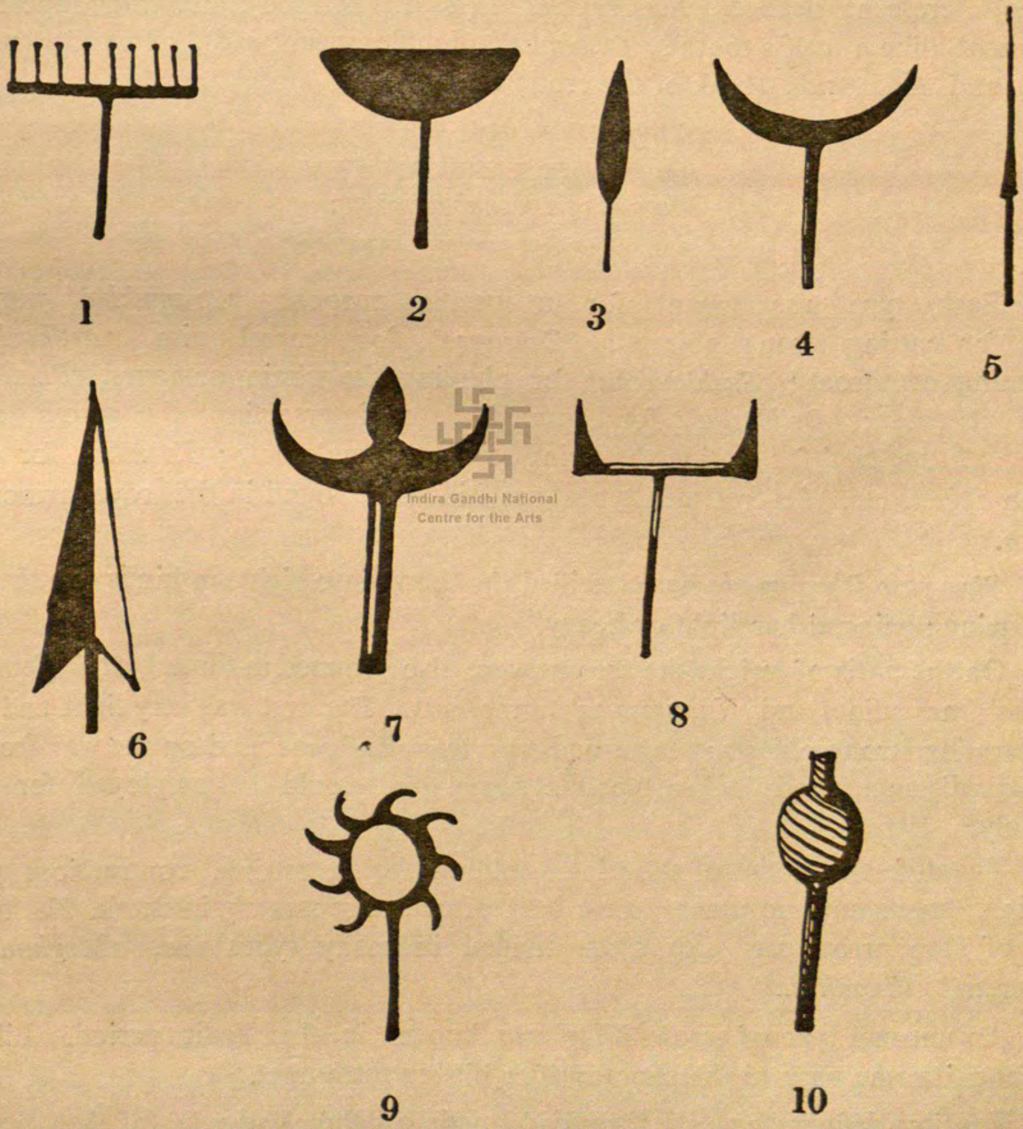
41. Alexander Cunningham, *The Stupa of Bharhut*, pl. XXXII.
42. John Marshall, *Guide to Sanchi*. pls. IV, V, XXVI, XXVII.
43. Karl Khandalvala, *Indian Sculptures and paintings*, pl. XII, No. 31.
44. C. Sivaramamurti, *Indian Bronzes*, p. 13, pl. I.
45 A. Stein , *Innermost Asia*, I, p. 95-6.
46. John Marshall, *Taxila*, II, p. 547.
47. *Ibid.*, p. 548.
48. *Ibid.*, p. 549.
49. *Ibid.*, p. 538, (see under stratigraphical chart).
50. *Ibid.*, p. 548.
51. *Ibid.*, pp. 548-9.
52. F.S. Andrews, *Descriptive Catalogue of the Antiquities*, C. XXV, P. 331.
53. *Ibid.*, p. 5.
54. *Ibid.*, p. 10. and also Central Asian Collection, National Museum, New Delhi
55. Kalidasa, *Raghuvamsam*, III, 59.
56. Kalidasa, *Kumarasambhavam*, I, 31.
57. *Ibid.*, I, 47.
58. *Ibid.*, XVI, 13.
59. Kalidasa, *Meghadutam, Uttaramegha* 48 .
60. Kalidasa, *Ritusamhara*, III,
61. *Ibid.*
62. Kalidasa, *Vikramorvasiyam*, V,7.
63. Fleet, *Corpus Inscriptionum Indicarum*, Vol. III, 1963.
64. A.S. Altekar, *The Gupta Gold Coins in the Bayana Hoard* (1954), Pl. V. 15 and Pl. VI. 2.
65. *Ibid.*, Pl. VI. 9, 10.
66. *Ibid.*, Pl. VII, 12 and Pl. XII. 5.
67. *Ibid.*, No. 1173.
68. *Ibid.*, No. 1167.
69. *Ibid.*, Pl. XXXIV, 21.
70. Gupta Gallery, National Museum Collection, New Delhi.
71. *Ibid.*
72. Yazdani, *Ajanta*, Part IV (Text), p. 33.
73. *Ibid.*, Pl. X, XI-A, XII-A.B.
74. *Ibid.*, Pl. 31 and Pls. X, XI-A, XII-a, b, XII, D. and XIII, A.
75. *Ibid.*, p. 34.
76. *Ibid.*, p. 74.
77. *Ibid.*, p. 92.
78. *Ibid.*, p. 101 and pl. LXVIII a.
79. *Ibid.*, p. 103.
80. Garde *et al.*, *The Bagh Caves* (1927), p. 52.
81. E.B. Havell, *Indian sculptures and painting* (1928), pl. XVII and p. 38.
82. Fleet, *op. cit.*, pl. XXXI, p. 225, line 7.
83. Fleet, *op. cit.*, p. 176 line 19.
84. K.M. Munshi, *Saga of Indian Sculpture*, pl. 82.
85. *Ibid.*, Pls. 84-85.

86. C. Sivaramamurti, *Op. cit.*, pl. 28, p. 39.
87. *Ibid.*, pl. 33, p. 44.
88. K. Khandelvala, *Op. cit.*, pl. 19, No. 52.
89. E.B. Havell, *Op. cit.*, pl. XLIII, p. 146.
90. D.R. Thapar, *Icons in Bronzes*, pl. XV.
91. K.M. Munshi, *Op. cit.*
92. Beal, *Records* I, p. 82-83.
93. Dacca University, *History of Bengal*, Vol. I (Calcutta, 1941), pl. LVII.
94. R.C. Majumdar, *Ancient India* (1952), p. 378.
95. Lane Pool, *Medieval India*, p. 9.
96. John Brigges, *Tarikh-i-Farista* (tr), Vol. I (London, 1870-72), p. 46-47.
97. A. Srivastava, *The Sultanate of Delhi*, 1953, p. 72.
98. Eillot, *Taj-il-Massir-un-Nizami*, Vol II, p. 209.
99. A. Srivastava, *Op. cit.*
100. Farista, *Gulshan-i-Ibrahimi*, Vol. II, pp. 286-87, 80, 91.
101. Abdul Ghani, 'A review of Pre-Mughal Persian Literature' *Urdu* Quarterly, (Delhi, 1943), pp. 98-101 (Courtesy Shri Y.K. Bukhari).
102. William Irvine, *The army of the Indian Mughals*, p. 62.
103. Abdul Aziz, *Arms & Jewellery of the Indian Mughals*, p. 10.
104. White Way, *Portuguese in India*, p. 249 and Irvine *op. cit.*, p. 99.
105. Baylay, *Gujarat*, p. 389 and Irvine, *op. cit.*, p. 99.
106. Erskine, *Babar and Humayun*, ii, 294 and Irvine, *op. cit.*, p. 100.
107. Gladwin, *Ain-i-Akbari* (tr), III, No. 38.
108. *Ibid.*
109. *Ibid.*, 110. No. 14.
110. *Ibid.*, 110, No. 15.
111. Arms Gallery, National Museum, New Delhi
112. Abdul Aziz, *op. cit.*
113. *Ibid.*
114. *Ibid.*
115. *Ibid.*
116. Mirza Mahdi, *Jahan Kushae Nadiri*, p. 233.
117. Captain Thomos Williamson, *Oriental Field Sports*, p. 87.
118. Warner and Others, *Persian miniature*, pl. 14.
119. Narasimhajini, Phia Library, Baroda.
120. Zubor Hajek, *Miniatures of the Mughal School*, 1960, pl. 3 and p. 327.
121. Gopi Krishana Kanoria Collection, Calcutta.
122. National Museum Collection, New Delhi.
123. Maharaja of Kishangarh Collection, Kishangarh.
124. National Museum Collection, New Delhi.
125. Fort Museum, Red Fort, New Delhi.
126. National Museum Collection, New Delhi.
127. N.C. Mehta Collection, New Delhi.
128. E.B. Havell (1928), *op. cit.*, pl. LXVIII. and p. 337.
129. *Ibid.*

130. Professor Sen, *The Military System of the Marathas* (New Delhi, 1950), p. 70.
131. T.S. Shejwalkar, *Panipat, 1761* p. 93.
132. Guru Govind Singh, *Sahastra namamala* in *Dasam Granth.*
133. Bhai Kahan Singh, *Guru Sabd Ratnakar Mahakosh*
134. W. Forbes Micehell, *Reminiscences of the Great Mutiny*, p. 76.
135. *Ibid.*, p. 76.
136. Mrs. Bishop, St. *James Gazette* (Dec. 1, 1894) ; and Irvine, *op. cit.*, p. 91.
137. Egerton, *Illustrated arms and Armours of India*, p. 130, No. 604 ; and Irvine *op. cit.*, p. 97.

BOWS AND ARROWS—TYPES

Leaving aside the flint arrow heads, coarse chips and chert blades and shallow-tailed type, the arrow-heads of the Indus Culture conform to one general type. They are very simple. In length they average 1·19 inches and in breadth and thickness 0·64



Vedic arrow heads (Conjectural).

1. Aramukh
2. Khsurapra
3. Gopuchha
4. Karnik
5. Ardhachandra
6. Suchimukh
7. Kakatunda
8. Bhalla
9. Batsadanta
10. Dvibhalla

and 0·77 inches respectively.[1] An unusual arrow-type illustrated in Pl. C XXVII. 2 of Mackay is leaf-shaped and 1·5 inches long.[2] Mackay takes it for lance-head but I would prefer to call it an arrow-head. Arrow-heads, here, are normally V-shaped, without tang or socket.[3]

Ancient Indian literature refers to arrow-heads of many types e.g. '*Aramukha*' (Serrated), '*Churapra*' (with a razor blade), '*Gopuchha*' (like the tail of the cow) '*Ardhachandra*' (crescent headed) '*Suchimukha*' (needle shaped), '*Bhalla*' (spear-head) '*Batsdanta*' (like a calf's tooth), '*Dvibhalla*' (double spear-head), '*Karnik*' (petal of flower) and '*Kakatunda*' (beak of the crow) etc.

आरामुखं क्षुरप्रं च गोपुच्छं चार्द्धचन्द्रकम् ।
सूचीमुखं च भल्लं च वत्सदंतं द्विभल्लकम् ।।
कर्णिकं काकतुन्डं च तथान्यान्यण्यनेकशः ।
फलानि देशभेदेन भवन्ति बहुरूपत ।।[4]

Each type was meant for a specific purpose. '*Aramukha*' was best suited for cutting strong objects ; '*Churapra*' for general aim, '*Ardhachandra*' for aiming at throat ; '*Suchimukha*' for piercing the chain armours, '*Bhalla*' for aiming at chest ; '*Dvibhalla*' for entangling or intersecting the arrow of the enemy. '*Batsadanta*' for cutting the string of the enemy's bow ; '*Karnika*' for cutting the iron objects etc. Several such types are still to be found in the royal armoury of Tanjore.

Sivavyasa Dhanurveda has classified the bows into eighteen kinds on the basis of the string ; being either light or heavy.

On the basis of weight the arrows were also grouped in three –'*Stri*' (feminine), '*Purusha*' (masculine) and '*Napumsaka*' (impotent). The first was very light and useful in penetrating strong objects ; the second was heavy and was used on the war front and for longer distances, and the last type was heavy and could be employed for taking aims only.

The different modes of shooting, holding the bowstring, contraction, pulling the string, targets and movements have been discussed separately in detail. The twirling sound of the arrow has also been divided in many types viz., '*Meghadhvani*', *Kakadhvani*,' '*Vinadhvani*' etc.

An unusual type of arrow '*Khag*' was known in the Vedic period. Like the Boomrang, it came back to the shooter after hitting the target.

Kautilya defines bows as '*Karmuka*' (made of tala) '*Kodanda*' (of *chapa*), '*Druna*' (of bamboo) and '*Dhanus*' (of bone or horn). '*Venu*', '*Sara*', '*Salaka*', '*Dandasana*' and '*Naracha*' were the different kinds of arrow :

"तालचापदारवशार्ङ्गिण कार्मुककोदन्डद्रूण धनूंषि"[5]
"वेणुशरशलाकादण्डासननाराचाश्च इषवः"[6]

R. Shamasastry has translated '*Mahasarayantra*' of Kautilya as a large machine to shoot arrows and '*Karpana*' as an arrow to be thrown by hand, weighing 7, 8 or 9 '*Karshas*'. "It can go as far as a hundred-bow length when thrown by a skilful person."[7] Apart from the 'double tang' variety the arrows from Taxila have been divided into eight different types, viz.,[8]

1 Flat with lozenge cross-section.
2 Flat with triangular cross-section.
3 Flat with rhombic cross-section.
4. Barbed.
5. Conical.
6. Three-bladed.
7. Flat with square cross-section.
8. Four barb-bladed.

The three-bladed type seems to have been specially favoured by the Sakas who introduced them in Taxila.[9]

Again, the bone and ivory arrow-heads of Taxila were of four types :[10]

1. Roughly shaped and sharpened at both ends.
2. With smooth circular point and well defined tang.
3. With a trilateral point.
4. Hollow-socketed.

The first type has been assigned to 6th century B. C. to 1st century A. D. by Marshall while the other three types date from 4th and 3rd century B. C.

In the early medieval period the archery underwent some changes. In the *Shahnama* of Firdausi dated A H. 833 (1429 A. D.) is seen a Persian quiver of bag type with snake design and long arrows.[11] Here the bow also is kept in the quiver. The tethered arrows can be seen on the sculpture of a caparisoned horse at Konarka while barbed arrows are depicted in the Dilwara temple.[12] The use of cross-bow and tiny arrows was quite popular during the times of Delhi Sultans

During the Mughal period, 'Cross-bow' was commonly used. A similar bow but smaller in size was '*Takhsh Kaman*'. '*Kaman-i-gurohah*' was a pellet bow more or less identical with modern '*Gulel*'. '*Gobhan*' was still another type denoting the sling.

'*Nawak*' was a small arrow. It was used with the cross-bow. Several such examples, though of later date, are to be found in the National Museum, New Delhi. Another type of arrow, found in '*Mirat-i-Ahmadi*' was '*Siham*'. '*Tukkah*' was the type of an arrow without a head but with a knot at the end. One such arrow was shot by Azam Shah at his general Zulfiqar Khan at Jajan on the 18th June 1707.[13]

Irvine has referred to '*Paikan-Kash*' (arrow puller). This implement was shaped like a pair of pliers and was used to extract arrow-heads from the body.[14] It also served the purpose of drawing arrows from the quiver. Two such specimens are on show in the Arms Gallery, National Museum, New Delhi.

Apart from '*Tarkash*', a different name '*Qirban*' has been assigned to the Mughal quiver. Egerton has mentioned five specimens.[15] Of these one is of an unusual shape of a cylinder. Slightly different from the usual Mughal pattern is a quiver given in Egerton's plate I, p 24. Here the quiver is of the same width all the way down, having one side straight and the other shaped in two crescent like curves. I have not been able to see the actual specimen but have seen it depicted in a painting in the Basoli style datable to 1764 A.D.[16]

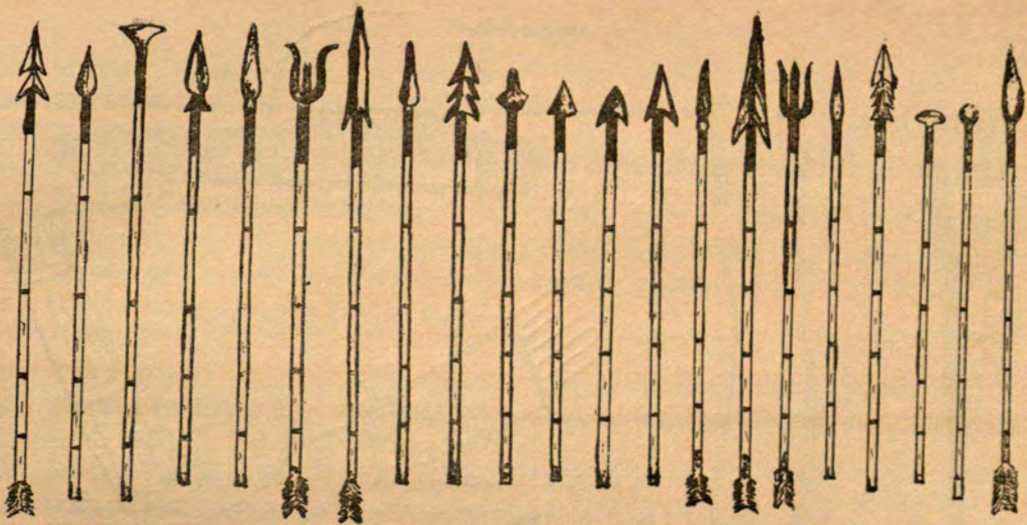
In the 18th century, the different types of arrows were in use among the Pathans of Farrukhabad. They have been named as '*Lais*' (Practising arrow), '*Qalander*', '*Kohartarash*', '*Ghera*' (broad-headed), '*Nuktab*' (headless arrow), '*Thuth*' (bill type) and '*Ankaridar*' (bent headed).[17]

The following names of arrows have been found in '*Dastur-ul-Insha*' : *Ghera* (broad-headed), '*Domuhanah*' (two pointed or barbed), '*Tarah-i-mah*' (circular headed), '*Tarash-i-hilai*', (half moon or crescent-shaped head), '*Tarah-i-badam*' (almond-shaped, head), '*Tarah-i-Toko*', '*Sen-bhalah*' (three spear headed i.e. trident-shaped), '*Tarah-i-Khormi*' (like the date), '*Tarah-i-Khar* (thorn-shaped) and '*Tarah-i-khaki.*'[18]

Some arrows in the Indian Museum, mentioned by Egerton, are 2 feet 4 inches long. One, referred to earlier is, as long as 6 feet.It was obtained at Lucknow in 1857, and must have been used with a very large bow.

James Fraser in his book '*Nadir Shah*' describes an interesting arrow used for practising against the earthen targets. "The arrows for this exercise have the iron part quite round, about four fingers long, of the size of the reed until near the point, where they are somewhat thicker, from which part they taper gradually to a sharp point. The length from the thickest part to the point is from a quarter to one inch."[19]

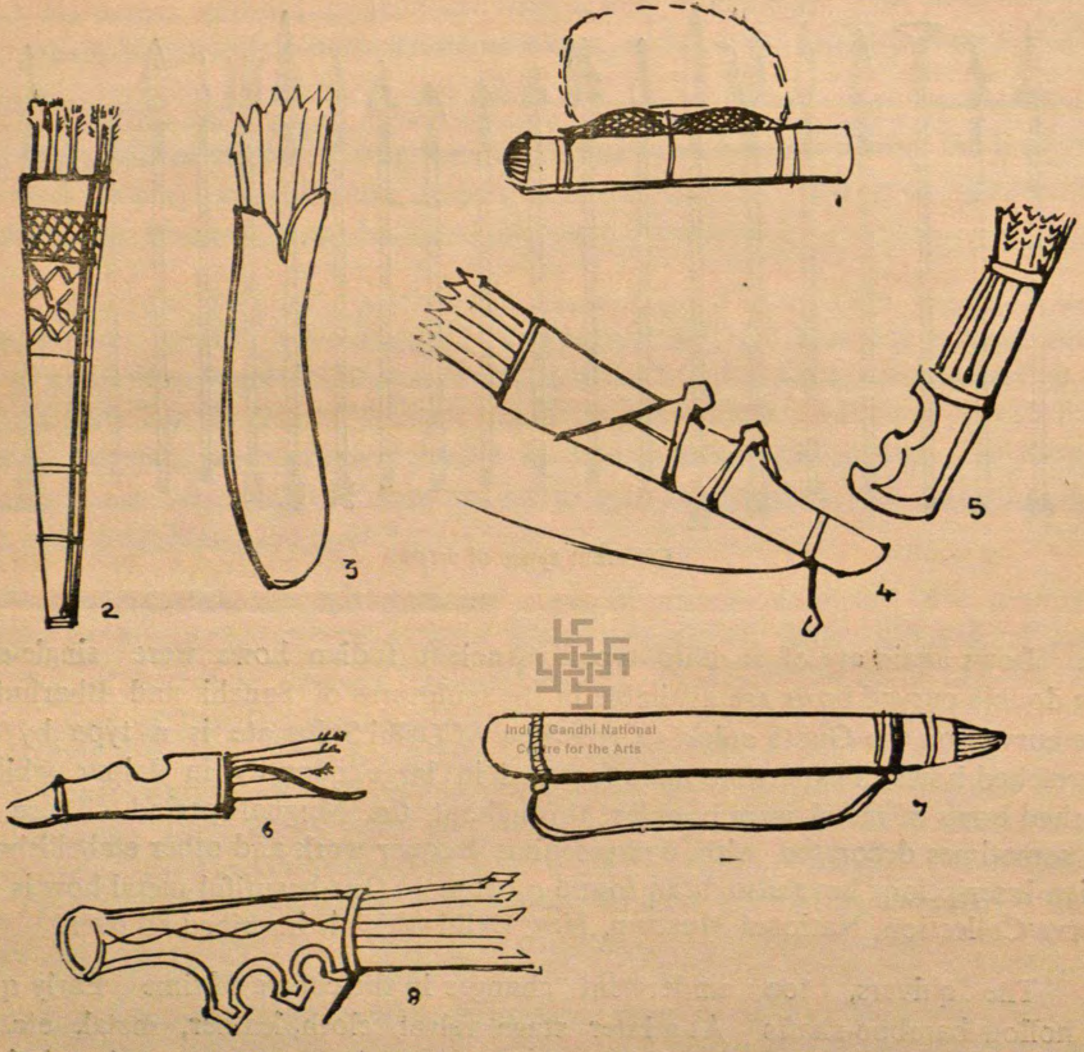
Most of these arrows can be seen in the Arms Collection of the National Museum, New Delhi.



Different types of arrows

Bows again are of various types. Ancient Indian bows were single-curved while double-curved bows are available in the sculptures of Sanchi and Bharhut and triple-curved on the Gupta coins. Cross-bow of Delhi Sultanate is a type by itself. Unstretched bows of cane were manufactured in large quantity in Jaipur while the stretched bows of metal were popular throughout the Mughal period. These bows were sometimes decorated with damascening, lacquer work and other embellishments. Persian inscriptions have also been found on some One beautiful metal bow is in the Reserve Collection, National Museum, New Delhi which is inscribed all over.

The quivers, too, underwent changes in the course of time. Early quivers were hollow bamboo shafts. At a later stage, velvet, cloth, leather, metal, etc., were also used. Silver quivers were known to have existed during the Mughal period.



QUIVERS

1. From Ajanta Paintings
2. From Orissan Ivory
3. From Jaina Paintings of Central India
4. From Ain-i-Akbari

5,6,8 Mughal

7. Tribal (modern)

References

1. Mackay : Vol. I., p. 461.
2. *Ibid* : Vol. I., p. 461.
3. *Indus Gallery*, National Museum, New Delhi.
4. *Dhanurveda Samhita* : Verse 65.
5. Kautilya : *Arthasastra* 2, 34, 18.
6. *Ibid*.
7. Shamasastry, *Kautilya's Artahsastra* : ed., tr. 1951, p. 110.
8. John Marshall : *Taxila*, Vol II, p. 547.
9. *Ibid.*
10. *Ibid*, p. 664.
11. Werner and Ormann : *Persian Miniatures*, No. 14, pl. 14.
12. K.M. Munshi : *Saga of Indian sculpture.*
13. Irvine : *The Army of the Indian Moghuls* (1962), p. 96.
14. *Ibid*, p. 101.
15. Egerton : *Indian and Oriental Armour*, (London, 1896) Nos. 367, 369, 460, 601 and 602.
16. National Museum, New Delhi,
17. *Journal Asiatic Soc. Bengal* : XLVII, 332 ; and Irvine, *op. cit.*, p. 98.
18. James Fraser : *Nadir Shah*, 143 Note ; and Irvine, *op. cit.*, p. 98.

ARCHERY : MATERIAL OF THE WEAPONS AND TECHNIQUE

In the Paleolithic stage arrow-heads were made of stone while in the Neolithic period flint came into use. These arrow-heads might have been tied to the wooden sticks with the help of string. During this time in addition to stone, wood, bone, ivory and anteler were also used.[1] In the Indus Culture metal arrow-heads were commonly employed, exceptions being 'chert blades' and 'flint prototypes.' The use of stone had almost become obsolete even before the foundation of the city. The specimen illustrated in Pl.CXLIII, 12 of Marshall is the only type of arrow-head that has been unearthed and obviously had a flint prototype[2]. It is a slight modification of the concave based flint arrow-head known to us from Egypt, Northern Persia and Western Europe in the Neolithic and Chalcolithic periods. Both 'Copper' and 'Bronze' were used in the preparation of arrow-heads. No metal arrow-head of this type has been found either in Egypt or Sumer but similar ones, though of later date, have been obtained in Minoan and Mycenean sites, and Mackay has rightly concluded that apparently it took time for the metal arrow-heads to oust the stone in some of the ancient cultures, perhaps metal was scarce and more expensive.[3] As already explained, flint and chert examples are very rare in the Indus Culture sites exceptions being from Kot Diji and Periano Ghundai in northern Baluchistan.

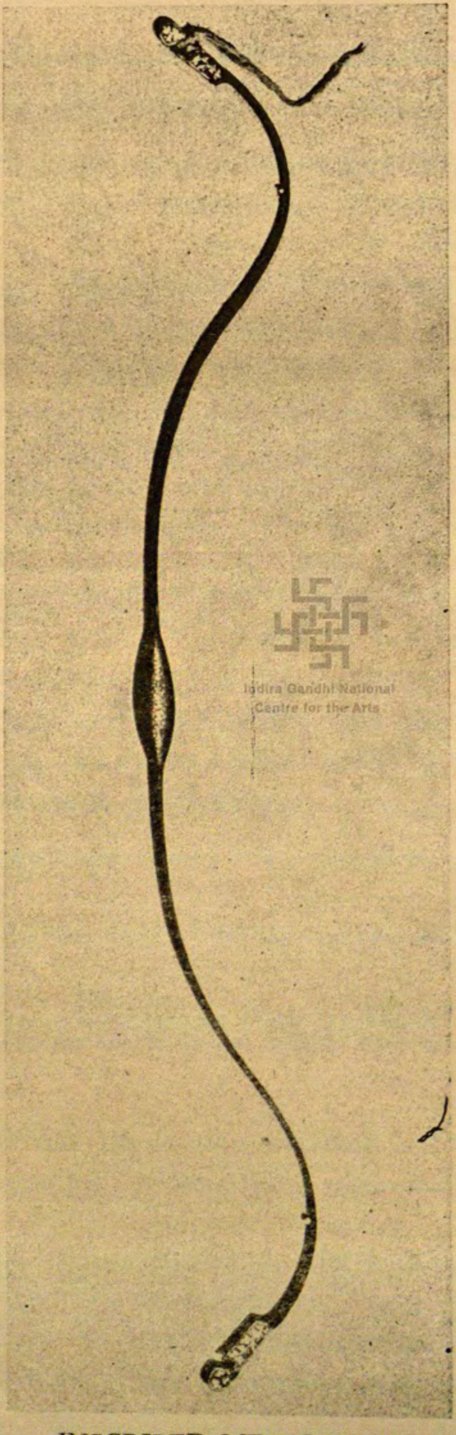
The Indus arrow-heads must have been hafted in a split-shaft and securely tied. In fact, it would have been quite impossible to set these heads in a shaft at all without enclosing them partially into the wood. For this purpose, holes were made in the arrow-head.

These arrow-heads, in each case, were cut out of the sheet metal, usually bronze.

The best material for the bow, according to *Dhanurveda*, is the horn. Both '*Pinaka*' of Siva and '*Saranga*' of Narayana were made out of it. Three principal materials have been prescribed for the manufacture of bows : iron, horn and wood and each has been divided in several categories. In the 'iron', gold, silver, copper, black iron, white iron and oily iron have also been included. Best 'horns' were of the buffallo, *Sharabh* (a Kashmiri animal) and deer. Several varieties of 'wood' such as sandal, *sal*, Cane, *kukubh*, *anjana* and bamboo, etc., have been recommended :

"दारुणि चन्दनवेतासधान्वन शालशाल्यलिसाककुभ वंशाजनानाम्"

(*Dhanurveda Samhita*, 49)



INSCRIBED METAL BOW,
MUGHAL, EARLY 17th Cent. A. D.

As for the bow-string, the *Atharvaveda* recommends silk and the next best were the hide of cow, buffalo and the deer. In case the above materials were not available, cotton threads twisted together and the bamboo-bark were the best substitutes. *Moonj*, *Bhang*, and *Aak* were certain other materials of a secondary nature whose strings could also be relied upon.

Arrows were usually made of *sara*, reed and bamboo. The feathers of crow, swan, peacock, hawk, eagle, etc , were attached to the lower end. Gold and silver feathers were also used. Arrows entirely of steel, were known as *Narach*.

सर्वलोहास्तु ये वाण नाराचस्ते प्रकीर्तिता ।
पंचभि: पृथुलै: पक्षैयुंक्ता सिद्धयैति कस्यचित् ॥[5]

To make it sharp, penetrative and poisonous, a liquid known as *vajralep* was recommended. Many formulae have been suggested for the preparation of such a concoction. How effective it could be in these days is doubtful.

Kautilya mentions arrows tipped with bone or wood so as to cut, rend or pierce. Bows were made of *tala* (palmyra), of *chapa* (a kind of bamboo), of *daru* (a kind of wood) and *sringā* (bone or horn). Bow strings were made of *murva* (*sanviera Roxburghiana)*, *arka* (*catogropis Gigantea*), *Sana* (*hemp*), *gavedhu* (*coix Barbata)*, *venu* (bamboo bark) and *Snayu* (Sinew) :

"मूर्वार्कशणगवेधुवेणुस्नायूनि ज्या:"

(*Arth* : 34, 18, 3)[6]

In later times also these materials were used along with steel. One steel bow, covered with rich gold inlaid work in the National Museum collection, bears inscribed verses from the Holy Quran (Pl. III) The grip of the Mughal *Kaman* was generally covered with velvet. Egerton describes the Persian bow in detail. The Mughal bows are similar to the Persian bow. He says : "The concave side of the bow (convex when strung) is lined with several strings of thick catgut to give it elasticity and force. The belly is made of buffalo or wild goat's horn, jet black and of a fine polish ; glued to this is a thick slip of hard, tough wood. The ends are fashioned to represent snake's heads. The horn is left plain, while the wooden back is decorated with rich arabesques of birds, flowers and fruit intermingled with gilding."[7]

The construction of a different type of bow is described by Captain Thomas Williamson. Bows were made of buffalo horn in two pieces, curved exactly alike and each having a wooden tip for stringing, the other ends were fastened to a strong piece of wood which served as the central grip. After being neatly fitted, the grip part was covered with animal fibres made to size. Finally to give a smooth firm grip fine leather was wrapped round it. Painting and varnishing was the final process in the making of the bow.[8]

During the Mughal and post-Mughal period *Zihgir* or the bow-string holder was in use. To prevent flesh being torn by the bow string this finger-stall was adopted. It was a bored ring and its material viz., precious stone, crystal, jade, ivory, horn, fishbone, gold or iron varied according to the status and means of the person.

The *Bhils* use '*Khampti*' or bamboo bow, with a string made of a thin strip of the elastic bark of bamboo.[9] *Adi* bows were generally made of a single piece of split bamboo having horn at each end. The arrows are made either wholly of bamboo or with an iron head in a reed shaft.[10]

Quiver is usually a flat case, broad at the mouth, one side straight and other converging to a point and provided with a strap for carrying over the shoulder. In early times it was usually made of leather ; its length varying between 2 and 3 feet. Ordinary ones were covered with leather, while the costlier ones with velvet and were embroidered in gold and silver on one or both sides. In the Anthropology Gallery of the National Museum, New Delhi there is a quiver made entirely of silver and lined with red velvet on the inside. It was perhaps used during festive occasions, or during dancing. Tribal quivers are normally made of bamboo. Quivers were also manufactured from metals.

Sachin Roy, Keeper, Anthropology Section of the National Museum, New Delhi, has beautifully illustrated the making of an Adi bow and arrow. The *Adis* select a straight bamboo piece and partially dry it over fire. Then the stave is shaped to the required thickness with the help of hand-made knives. The natural green colour of the stave changes to brown and thus the bamboo is seasoned. The stave is then flattened. At each end there is a horn but the loop is provided on one side only. The lower end of the stave is rested on the ground and bending it through pressure applied from the other end the bow is strung.”[11]

The simple arrow made out of a clean piece of bamboo is shaped, pointed and hardened in the fire. The other non-functional end is feathered with leaves, inserted diagonally and fastened with the strings. The arrow has concave notch at the bull end. The arrow-head is barbed on either side of the shanks ending in a sharp point. The pointed tang is inserted in the shaft and tied with cane-strips.

The quivers, made of bamboo, have closed bottom and covering lid for the mouth. 12 to 15 arrows can be carried in it. The quiver is suspended from the shoulder by an attached strap.

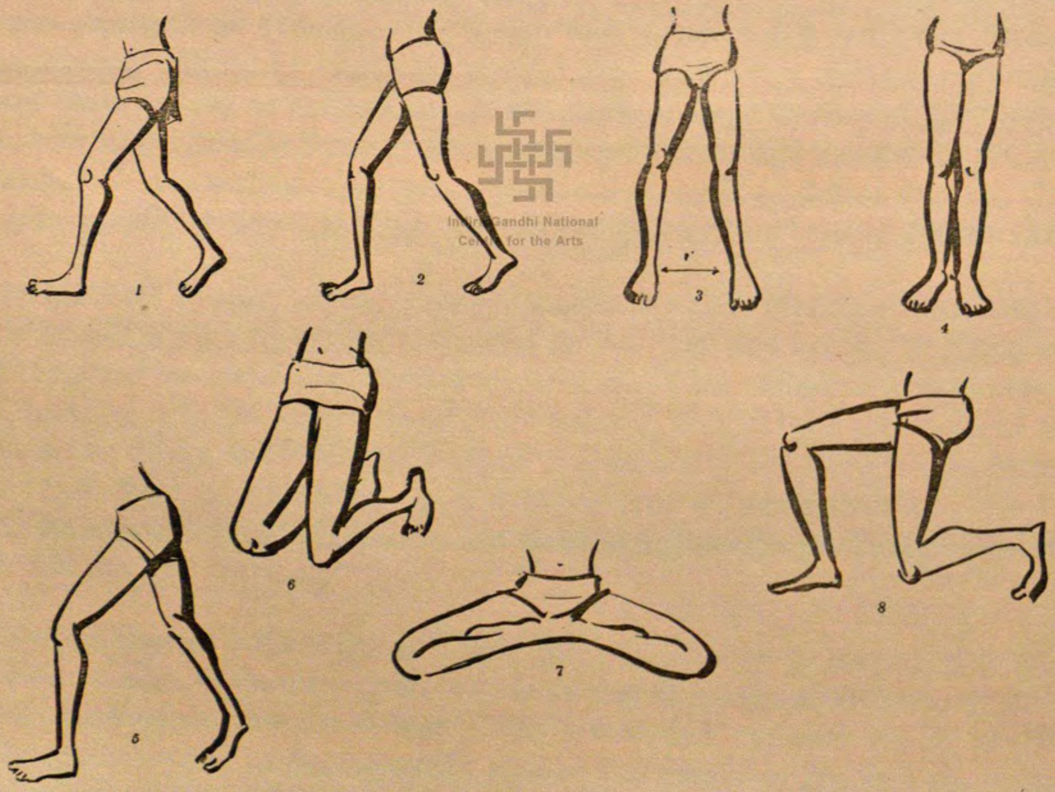
References

1. D. Majumdar and Gopal Sharma, *Pragitihasa* (1964), pp. 36-50.
2. John Marshall, *Mohenjo-daro and the Indus Civilization*, Pl. XLIII.,12.
3. Mackay, *Further Excavations at Mohenjo-daro*, Vol. I, (New Delhi, 1943), pp. 461-2.
4. *Dhanurveda Samhita*, Verse 49.
5. *Ibid.*, Verse 73.
6. *Kautilya Arthasastra*, ed. Vachaspati Gairola, (1962), 9. 210.
7. Egerton, *Indian and Oriental Armour*, p. 144 quoted by Irvine, *Army of the Indian Moghuls*, p. 92.
8. Thomas Williamson, *Oriental Field Sports*, as quoted by Irvine, *op. cit.*, p. 93.
9. T.V. Nayak, *The Bhils—a study*, 1956, p. 32.
10. Sachin Roy, *Journal of Asiatic Society* (*Science*), Vol. 22, No. 2, (1957).
11. *Ibid.*

ARCHERY : OPERATIONAL METHODS

Dhanurveda stipulates that a disciple must be conversant with all the methods of using the bow and arrow. To begin with he should hit a flower with blunt-headed arrow and then a fish and a piece of flesh respectively with pointed heads :

"प्रथमं पुष्पवेधं च फलहीनेन पत्रिणा।
ततः फलयुतेनैव मत्स्यवेधं चकारयेत
मांसवेध ततः कुर्यादेवं वेधो भवेत्रिधः
एवैंविधैः कृतैः पुसांशरां स्युः सर्वसाधकाः"



POSITIONS (Standing)

1. **Vishampada**
2. **Pratyalidha**
3. **Vaisakh**
4. **Sampada**
5. **Alidh**
6. **Dadurkrama**
7. **Padmasana (Sitting)**
8. **Garudkarama**

Eight positions for shooting arrows are laid[1] down. The first is '*sampada*' where the archer has to stand erect with ankles, calves and thighs taut and the palms of hand and thumb touching, while in the '*vishampada*' the left leg is stretched out, right held back and the body slightly bent.

"समपादै: समौ पादौ निष्कम्पौ च सुसंगतौ
असमे च पुरो वामे हस्तमात्रनतं कपु:[2]"

The first position has been represented at Bharhut (2nd Century B.C.) on the famous medallion illustrating the *Ruru Jataka*[3]. The second position *vishamapada* is seen in Amaravati (2nd cent B.C) where king Udayana is aiming an arrow at one of his innocent wives thinking her to be guilty.[4] The future Buddha shown in the Bharhut relief is depicted in the third, i.e. '*Vaisakh*' position of shooting standing on the tips of his toes with thighs together but feet nine inches apart.[5]

"पादौ सविस्तरौ कार्यो समो हस्तप्रमाणत:
विशाखस्थानकं ज्ञेयं कूटलक्ष्यस्य वेधने"[6]

In the fourth, or the '*Alidha*' position, the left leg is bent while the right stretched out obliquely ; the knees kept about nine inches apart :

"आलीढ़े तु प्रकर्त्तव्यं सव्यं चैवानुकुंचितम
दक्षिणन्तु पुरस्ताद्वा दूरपादे विशिष्यते"

Kalidasa says that Raghu was looking more charming, while fighting with Indra, in the '*Alidha*' pose :

स एव मुक्त्वा भघवन्तमुन्मुख: करिष्यमाण: सशरं सरासनं।
अतिष्ठदालीढ़ विशेष शोभिना वपु:प्रकर्षेण विडम्बितेश्वर: ।।[8]

Fine examples of the fourth posture are from Pattadakal (7th cent.) and Borobudur (8th cent.) illustrating *Avadana Jataka*.[8] Siva as Tripurantaka is shooting the arrow from his *Pinaka*, standing in the *Alidha* pose.[10] The National Museum at New Delhi has recently acquired a unique image of Harihara in which the deity is shown seated in *Alidha* pose (Acc. No. 68.137 Ht. 51 cms). This Pratihara sculpture of c. 10th century A.D. is the only example of Harihara in this pose. '*Pratyalidha*' is the reverse of *Alidha*.

अग्रतो वामपाव दक्षिणे चानुकुंचितम् ।
प्रत्यालीढं प्रकर्तब्यं हस्तद्वयस्य्विस्तरम ।[11]

'*Pratyalidha*' is best illustrated in the Bodhisattva at Borobudur[12] and Mahisasuramardini of Bihar.

In the sixth position i.e. '*Nischatr*' heels are to be placed together, the left leg should be taut and the right bent. In the Papanath temple at Pattadakal (7th cent.),[13] there is good representation of this posture.

In the '*Vikata*' position right leg is taut and the feet are wide apart. It is depicted in the Rani Gumpha Cave, Udaigiri (1st cent. A.D.)[14] With the neck and head still, chest out and with shoulders back thus making a triangle, the posture is known as '*Dridha*'. Cave No. X of Ajanta portrays the tale of Shyama who was shot dead by the king in '*Dridha*' position of shooting, The king of Benaras holding bow in '*Chitradushkara*' pose is shown ordering his followers to shoot the monkeys (*Mahakapi Jataka*.)[15]

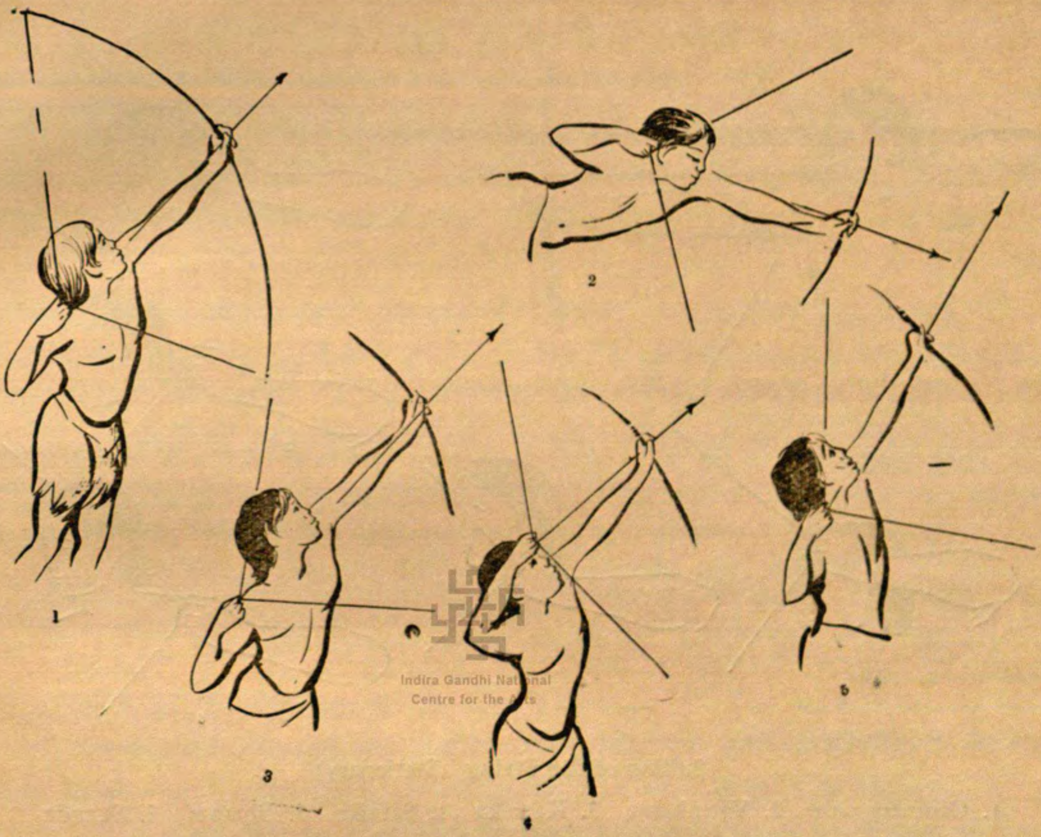
Agnipurana, however, mentions ten positions including '*Mandala*' and '*Dandayat*'. The '*Chitradushkara*' pose, referred to above, has also not been included in these eight positions.

Three sitting poses are also referred. In the '*Dadur-krama* (like a frog) both the legs were bent with the knees resting on the ground. This position was effective to pierce strong objects :

आकुंचितोरु द्वौ यत्र जानुभ्यां धरणीं गतौ ।
दर्दरक्रममित्याहुः स्थानकं दृढ़भेदने ।।[16]

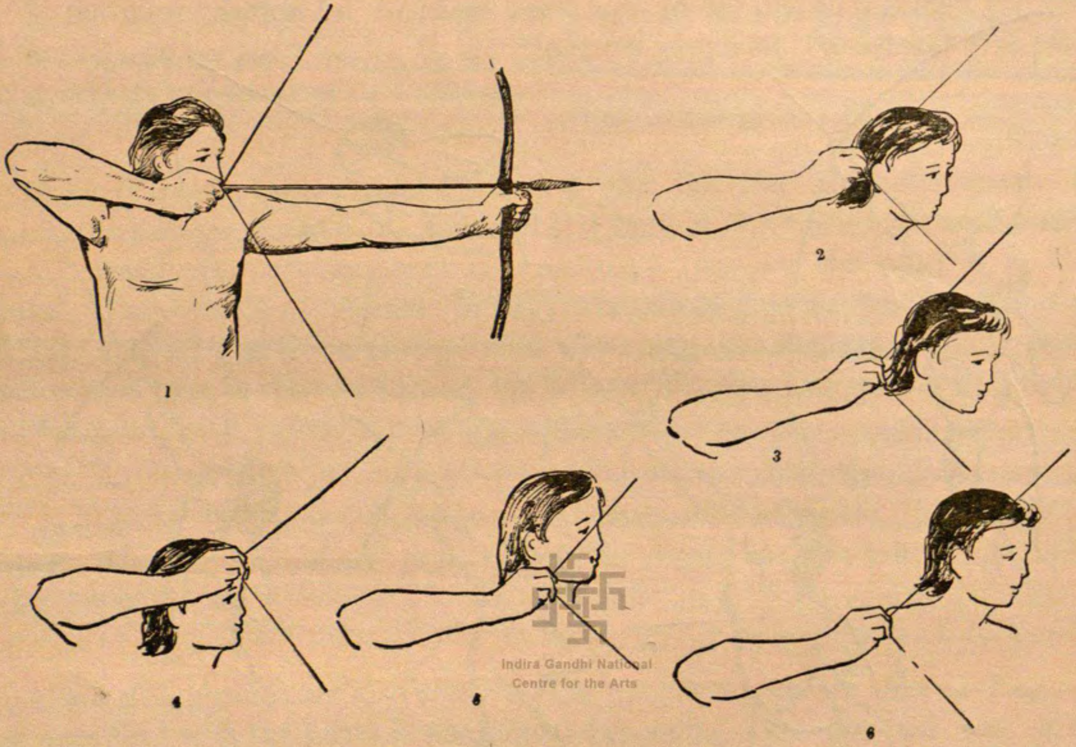
In the '*Garudakrama*' (like Garuda), the left leg[16] rested on the ground and the right half bent. In a painting of the Mughal school, Prithviraj Chauhan has been depicted sitting in this pose and holding bow and arrow.[17] Similar pose is seen in one of the Konarak sculptures displayed in the National Museum, New Delhi. The third sitting position was the usual '*Padmasana*'.

Holding the string termed '*gudamusthi*', was of five ways : '*Pataka*' (like a a banner), '*vajramusthi*' (like fist), '*simhakarni*' (like the ear of lion), '*matsari*' (fish-type) and '*kākatundi*' (like the beak of a crow). Stringing of the bow (*Sandhan*) was effected in three ways : '*sama sandhana*' '*Urdhva-sandhana*' and '*adha-sandhana*'. The first was useful while hitting the object at a distance, second was specially meant for the 'stationary target' while the third position was meant for piercing strong objects.



Pulling of the String (in a charging pose)

1. Kausika 2. Vatsakarna 3. Skanda 4. Satvika 5. Bharata



Pulling of the String (Stationary)

1. Ordinary pose 2. Vatsakarna 3. Kauṣika 4. Satvika 5. Bharata 6. Skanda

Pulling of the string was known as '*vyaya*' which was done in five ways: '*kausika*', '*satvika*', '*vatsakarna*', '*bharata*' and '*skanda*'. In the first pose the string was drawn up to the hair; while in the other postures up to the forehead, ear, neck and shoulder respectively.

Target has been classified into four types: '*sthira*' (still), '*chala*' (unsteady), '*chalachala*' (still and unsteady, where either the archer or the target is unsteady) and '*dvaychal*' (when both the shooter and the target are moving).

Thus mastering the above mentioned postures the *Dhanurdhara* (archer) took the bow in his left hand and gripped the middle portion of the stave with his left palm. When the archer stretched his bow and took correct position (one of the ten mentioned above), he raised the bow and placed the feathered and notched arrow on the string The string is held in one of the five prescribed ways and contracting the bow (in one of the three), the bow is raised till it is in line with his eyes and ear. Having positioned the bow, the arrow is pulled towards his right breast in any one of the five ways already mentioned. Finally having concentrated his attention on his target (one of the four types) the archer released the arrow which was sure to hit.[18]

These principles and stages were observed in ancient India. During Alexander's invasion (326 B.C) we, however, find that the archers of 'Porus' were armed with bows made of equal height of the man who used it. The archer rested his bow upon the ground, and pressing the string with his left foot discharged the arrow. Since the shaft he used was a little short of three yards it became ineffective.[19]

During the Mughal period some of these principles were modified to suit the times. We are told in the *Risalah-i-tir-o-Kaman* that in archery there were twelve maxims to be adhered to.[20] These maxims can be broadly categorised into four: firmness, easy, straight and the use of one limb. All these pertain to aiming at the target. The first category, requires that the grip on the bow should be firm and tight, the fore-finger should be firm and the advanced foot should also be firmly planted on the ground when the arrow is discharged; the second stipulates that the left leg and left foot and other fingers not in use be at ease; the third pertaining mainly to the position of the body lays down that the body and elbow should be straight with the forehead high up. The fourth class, essentially meant for taking aim, insists upon the use of one side, one eye and even the hands are to be in one direction.

Characteristics of a defective arrow can be recognized when it has

(i) Too wide a notch,
(ii) a weak shaft,
(iii) an imperfect head,
(iv) too heavy head,

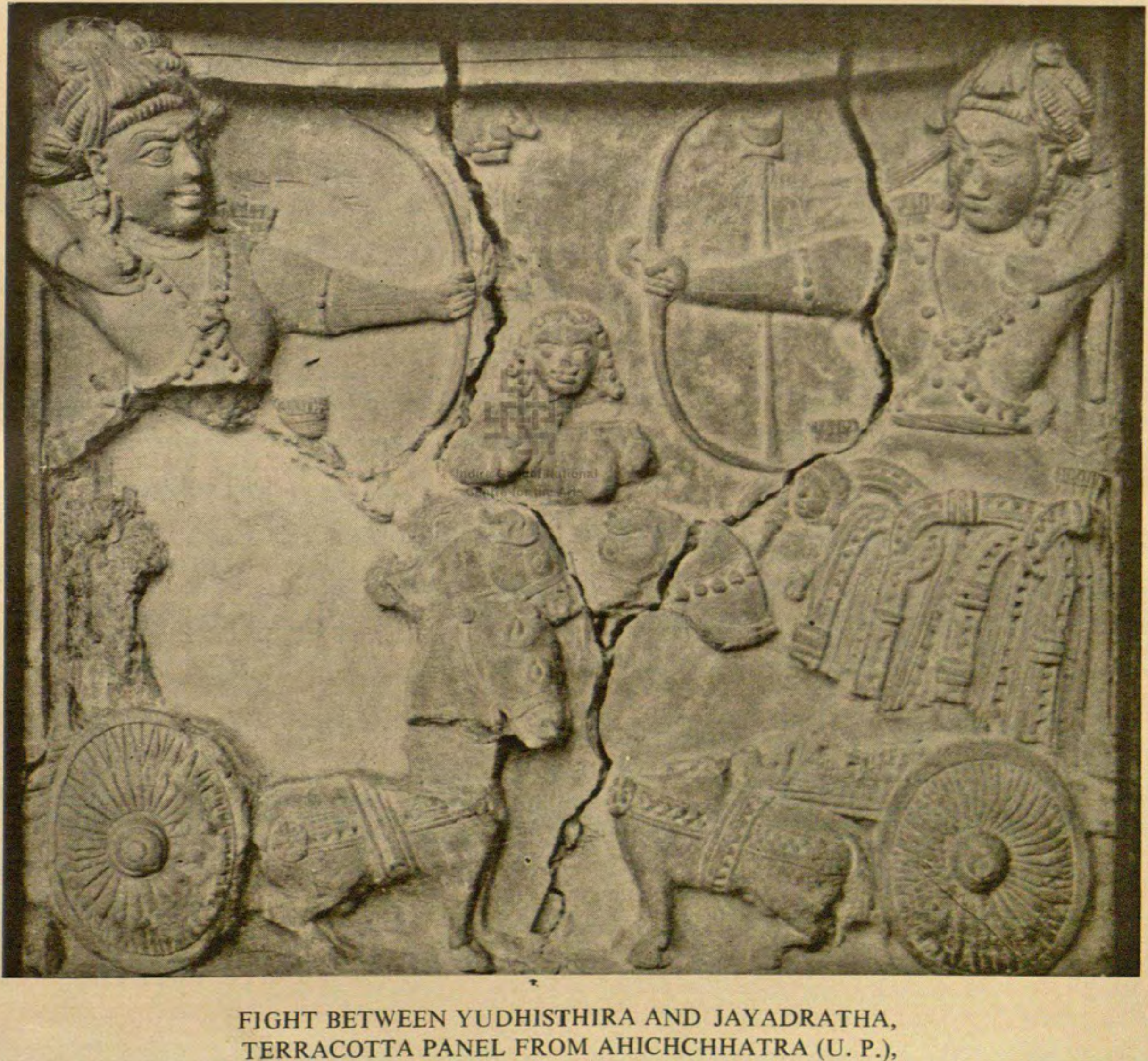
(v) crooked shaft,
(vi) the top end and the butt of the shaft hollow,
(vii) the stiff bow.

In order to shoot a horseman at a distance of 200 yards the archer should aim at the rider's cap. If, however, he is 100 yards away, at his mouth, if 50 paces away, at his saddle. By doing so one would hit him on the chest. There were three other popular ways of gripping the bow, *changal-i-baz* literally meaning Hawk's Claw '*muharraf*' (diagonal) and '*murabba*' (square) ; depending upon length of the shooter's fingers.

During the Mughal period and afterwards, these maxims were observed. A few other precautions have also been recommended. The arrow was to be held without moving and the advanced foot kept flat on the ground. The bow was strung by placing one end under the thigh with both hands bringing the other end in required position and the string into the groove intended for it. The left hand was placed opposite the right breast, just far enough from the body to allow clear action ; the butt of the arrow was pressed to the string, the fore and the middle fingers of the right hand together with the string, drawn steadily until the head was near the forefinger of the left hand. The bow was generally held in a vertical position to the body.[21]

Among the aboriginal tribes of India, the *Bhils* hold the bow by the left foot, drawing the string with the hand and shooting so forcefully that the arrows penetrate elephant's hide.[22] The *Adis* of NEFA, however, mount their string on the stave only when in use.[23] Lower end of the stave is pressed down and the upper end drawn below. The knots of both ends of the string face inward. The *Adis* hold their bow almost perpendicular to the body holding the stave with left hand and arrow with the fingers of the other. The string of the bow fits into the notch of the arrow and the butt of the arrow is held in position by the thumb and the index finger. The string along with the arrow is fully drawn towards the belly and released suddenly after taking proper aim. A good shot from the *Adi* bow could strike accurately at a distance of 100 yards or even more.

Plate IV



FIGHT BETWEEN YUDHISTHIRA AND JAYADRATHA,
TERRACOTTA PANEL FROM AHICHCHHATRA (U. P.),
GUPTA, 5th Century A.D.

(*Collection* : *National Museum, New Delhi.*)

References

1. *Dhanurveda Samhita*, verse 25.
2. *Ibid.*, verse 80.
3. A. Cunningham : *Bharhut*
4. C. Sivaramamurti : *Amaravati Sculptures in the Madras Museum.*
5. Jeannine Auboyer : *Arts and Letters*, XIX, No. I (1956), p.3.
6. *Dhanurveda Samhita*, verse 79.
7. *Ibid.*, verse 78. Garuda has been often depicted in *Alidha* pose, see B.N. Sharma, *Rooplekha*, XXXV, No. 182 (New Delhi), p.31.
8. Kalidasa : *Raghuvamsa*, III, 52.
9. N.J. Krom : *Barabudur*, Vol. I (1927), pp. 432 462.
10. *Early Medieval Gallery* : National Museum, New Delhi, and B.N. Sharma : *Journal of the Oriental Institute*, Vol. XVIII, No. 1&2 (Baroda), p. 158.
11. *Dhanurveda Samhita*, verse 77.
12. N.J. Krom : *Barabudur*, Vol. I (1927), p 151.
13. See Papanatha temple
14. See Rani Gumpha Sculptures
15. Yazdani : *Ajanta*, Part IV (Text), p. 34
16. *Dhanurveda Samhita*, verse 81.
17. *Gallery of Arms*, National Museum, New Delhi.
18. *Agni-Purana* : CXLIX 19-29, M.M. Dutt Edition, p. 896.
19. Arrian : *Indica*, Chap, XVI.
20. Quoted by Irvine : *Army of the Indian Moghuls* (1962, New Delhi), p. 102.
21. W. Irvine : *op. cit.*, p. 103.
22. T.V. Naik : *The Bhils—a study* (1956), p. 32.
23. Sachin Roy : *Journal of Asiatic Society* (Science), Vol. 22, No. 2 (1957).

MOUNTED ARCHERY

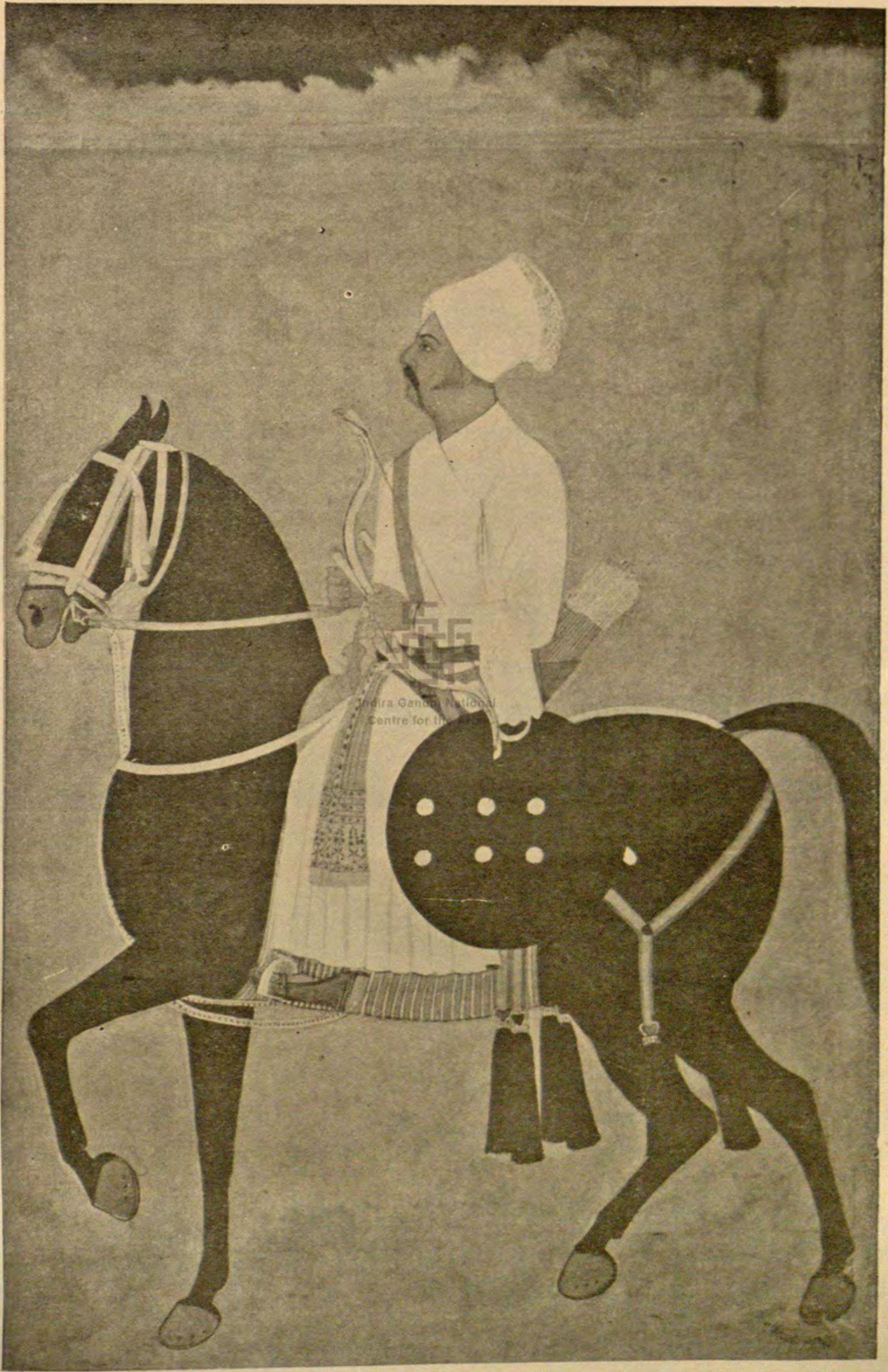
In the early and later Vedic period it was the usual practice with warriors to shoot arrows from the chariots. The epics *Mahabharata* and *Ramayana* contain several references to this fact. Even in the days of Magadhan greatness we find men shooting arrows from chariots and elephants. Each chariot of Porus was drawn by four horses and carried six men of whom two were archers. Surprisingly, there is not a single reference to archers mounted on a horse before the Scythian period (c. 2nd century A.D.). The epics also are silent about this. Even the historians of Alexander's times make no mention of horsemen with bows and arrows. Therefore, it may rightly be surmised that archers mounted on horses came with the Parthians into India. The coins of King Azes I, Azisiles, Azes II and Satrap Zeonises depict horsemen with bows.[1] There are grounds to believe that mounted archers played a leading part during Gupta period.[2] At Ajanta Cave No. 17 in the painting depicting the *Sarabha Jataka*, the king is seen riding a spirited horse. Quivers filled with arrows can be seen suspended from the saddles of the king and his retinue.[3] Again in the painting of *Simhala Avadana* in the same Cave elephant-riders including Simhala himself are shooting arrows at the demons. · Quivers with arrows are attached to the side of the 'Hawdahs.'[4] Kalidasa in his *Kumarasambhava* (16.37) describing the fight between Indra and Taraka has illustrated the elephant and horse-archers :

"घन्विन स्तुरगारूढ़ा गजारोहा उशरैक्षतान"

Dasharatha could conquer a large territory from his chariot with the simple bow and arrow.[5] In one terracotta plaque from Ahichchhatra king Yudhistira has been shown fighting Jayadratha ; the two warriors contesting with bows and arrows (Pl. IV).

The coins of Chandragupta II, Kumaragupta I and Prakasaditya afford valuable material on horse-archery during this period. P.C. Chakravarty believes that "The art of mounted archery did not strike roots in Indian soil. Introduced by the Parthians and continuing for a time as a sickly exotic, it withered away shortly after the Gupta period."[7] But, the evidences seem to be otherwise. Chakravarty has perhaps, not noticed the several references of horse and other mounted archery in paintings and the literature of post-Gupta period. There are illustrations of chariots and armed warriors from Paharpur (Pl. LVII) in the Pala Period (A.D. 750-1115.)[8] During the battle "Sultan (Mahmud)" writes Minhajus-Siraj "drew up in battle array. The light armed horsemen were directed to advance and harass the enemy on all sides with their arrows." Ashirvadi Lal Srivastava has recorded in his book *The Sultanate of Delhi* that

Plate V



CAVALIER ARMED WITH BOW, ARROWS AND OTHER WEAPONS, RAJASTHAN, Mid. 18th Cent. A.D.

(Collection : National Museum, New Delhi.)

the cavalry was the most valued wing and formed the backbone of the armed forces. Each horseman was armed with two swords, one dagger and a bow and arrows.[9]. The two sculptures of war horses, adjoining the southern facade of the Konarak temple in Orissa, are shown with quivers ; which furnish proof of mounted horse-archery in the mid. 13th century.[10]

The Mughal bowmen were considered to be expert archers. Bernier observes, "A horseman shooting six times before a matchlock can fire twice." Abul Fazl speaks of cross-bowmen in Hemu's army riding on the backs of the huge elephants.[11] When Muhammad Khan Bangesh invaded Bundelkhand in 1727, two Rajput heroes equipped with bows and arrows drove their horses with so close to the elephants that the horses could place their forefeet on them and only after a great struggle they were killed by the Mughal arrows.

In one Mughal painting of *circa* 1595, Kubla Khan has been painted as holding bow and arrow, mounted on the prancing steed and trying to cross the Ganges.[12] The painting in the Fort Museum, Red Fort, Delhi, depicting Dara Shikoh with his army also furnishes example of horse-archery[13] In one painting of Guler Darbar Collection (Pre-Kangra Kalm)-A D. 1700, Govardhan Chand is portrayed with bow and arrows. A similar painting is in the Punjab Museum where Govardhan rides an elephant with bow and arrows.[14] In the Bikaner School of painting of c A.D. 1745 Raja Zorawar Singh and his courtiers are shown mounted on prancing steeds. One of them is holding bow at the back with a quiver attached to his side.[15] Similarly, in a Rajasthani painting, now in the National Museum, New Delhi, a Rajput King has been painted holding bow and riding on a horse. A quiver filled with arrows is attached to his side. (Pl. V)

The ivory throne-leg in the collection of the Asutosh Museum Calcutta (16th cent. A.D.) is a remarkable specimen depicting scenes of horse-archery. The slightly curved leg contains an animated hunting scene. The hunter is mounted on a rearing charger, fully caparisoned. He wears a turban with beaded transverse band, a full sleeved mail-shirt, trousers and riding boots. He is equipped with a dagger, a sword, a spear and a bow across the shoulder. A sword and a quiver are attached to the sling. On the left side of the horsemen, a turbaned hunter is seen equipped with sword, shield and a strap to which is attached a quiver[16]. A similar ivory throne leg depicting archery is in the collection of the Indian Museum, Calcutta (ht. 38 1 cm.). It is from Madura and dated to the 18th cent. A D. by Villa Hugel,[17] and 16th cent. by Moti Chandra.[18] The ivory throne-leg in the collection of Narendra Singh of Calcutta belongs to the same group. Here also the hunter is holding sword, bow and quiver. It is dated to the 16th cent. A.D.

Burton, 1844, has praised the Indian horsemen "The Indian style has the merit of holding the horse well in hand, making him round at the touch of heel, stopping him dead at a hand gallop and wheeling him round on a pivot."

References

1. Smith : *Catalogue of the Coins in the Indian Museum, Calcutta*, pp. 43-4.
2. Allan : *Gupta Coins*, Pls. VIII, 11-19 and XXII.
3. Ajanta Cave No. 17 *Sarabha Jataka.*
4. Cave No. 17 *Simhala Avadana.*
5. Kalidasa : *Kumarasambhava,* 16.37.
6. National Museum, New Delhi (*Gupta Gallery*).
7. *A.W.A.I.*, p. 42.
8. *History of Bengal*, Vol. I (Dacca University, Calcutta, 1944).
9. A.L. Srivastava : *The Sultanate of Delhi* (1953), p. 331.
10. K.M. Munshi : *Saga of Indian Sculpture.*
11. Abul Fazl : *Ain-I-Akbari.*
12. Zobor Hazek : *Miniatures of the Mughal School* (1960), Pl. 3 ; p. 327.
13. *Ibid.*, Pl. 41.
14. Karl Khandalvala : *Pahari Miniatures*, No. 107 and 108 Supp.
15. W.G. Archer : *Indian Miniatures* (1960), Pl. 54.
16. Moti Chandra : *Prince of Wales Museum Bulletin*, pp. 56-7. and Pl. 14a, 15a.
17. Villa Hugel : *Catalogue No. 325*, p. 413.
18. Moti Chandra : *op. cit.*, p. 57.

National
Centre for the Arts

ARCHERY—A SACRED GAME

Archery was not only a means of defence but it was also regarded as a specialized game. In India there is a relation between the utilitarian and ritual character of an activity and archery is a good illustration of this dual aspect.[1] Vedic literature assigns four roles to it, viz., war defence, hunting and recreation In the game known as *matsya vedha* the archer was required to hold one arrow in hand, another by the foot and was to shoot five arrows in the air in succession and hit a fish-target placed above (Pl. VI) Arjuna won the hand of charming Draupadi in such a tournament In another game called *kharjurvedha*, the leaves, fruit and trunk of a tree were formed by the skilful discharge of arrows from a distance. In *yamatyarjuna* two arrows were shot simultaneously to hit a single target and in *vikatarjuna* two arrows were shot at two separate goals simultaneously from the same bow. Successive arrows were shot in '*malvidyadhana*' game. *Varaha Samhita* and "*Abhilashitarth chintamani*" have mentioned two hundred and eighty four varieties of such games.

In the *Ramayana*, Rama wins Sita as his bride by bending the great bow of Siva. Gautama Buddha, we are told, had, as young Siddhartha proved his prowess against all competitors in a tournament arranged by Raja Suprabudha and won the radiant Yasodhara, the daughter of the king, for his wife. The scene is engraved on stone panel at Borobudur Jawa and is dated the 8th cent. A D. *Mahabharata* recounts many instances showing the prowess in archery, such as bringing *Airavata* to earth from heaven and Eklavya stitching the mouth of Arjuna's dog with his arrows.[2]

John Marshall rightly asserts that bone and arrow heads from Taxila (dated 6th cent. B.C. - Ist Cent. A.D) could hardly have been intended for serious warfare. These were employed for practising archery, shooting birds or were found useful by the town police, they being less deadly than iron ones.[3]

A Begram-ivory carving (2nd-3rd century A.D.) shows a horseman bending his bow and turning round on his steed.[4] An archer in the "*Bhaddasala Jataka*" had hit 500 enemies with a single arrow. Raja Prithu shot three arrows while preparing the *Rajasuya* sacrifice signifying the earth (*Drava*) air (*Ruja*) and sky (*Sukshma*).[5] In the *Milindpanho* arrows of grass, straw and clay are mentioned.[6] *Satapatha Brahmana* speaks of archery as a sacred and intelligent game.[7] A panel from Amaravati illustrates an episode of the pusillanimous King Udayana (second cent. A.D.) who seized his bow to kill one of his wives who though innocent was considered unfaithful by him.

The poisoned arrow rebounded from the innocent lady's breast killed the king on the spot.

The right pillar of the West Gate of the Great *Stupa* of Sanchi depicts the *Mahakapi Jataka.* Anxious to dislodge the monkeys, Brahmadutta, the king of Benaras orders his archers to aim at these moving targets. This type of archery was known as *Chitradushkara.*

According to *Visuddhi Magga* (674) a blindfolded archer perched on a moving wheel pierced successfully a hundred boards at a distance of some one hundred and sixty-four feet being guided by the sound of a stick.[8] The hero of *Sarabhanga Jataka* stands in the centre of a square formed of four banana trees. His arrow of scarlet string, penetrated the trunks of all the trees in a circle.[9] Cave No. 10 at Ajanta contains a pathetic tale of Shyama, the only son of old, blind parents was taken to be an animal and shot dead (cf. the story of Sravanakumara and Dashratha in the *Ramayana*) Indo-Scythian kings were skilled in horse-archery and Gupta emperors could kill tigers and even rhinoceros with bow and arrows, as is evident from innumerable coins Archery also represented on a panel from Pattadakal (7th Cent. A.D.), Borobudur (8th Cent. A.D.), Chalukyan (8th Cent: Western Chalukya), Jaina images (11th Cent. A D , Satran, Rajasthan), Sun Temple (A.D. 1237, Konaraka), Mandsor images (15th cent. A D.), etc.

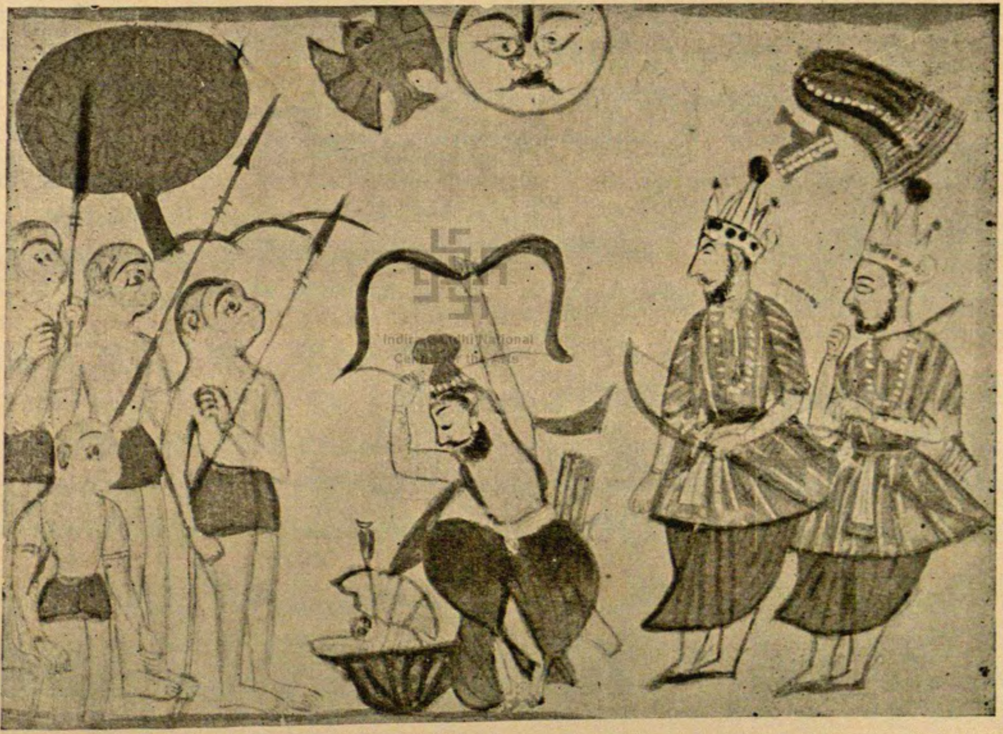
Siva is generally represented holding his bow called *Pinaka.* Subrahmanya has among his weapons, bow and arrow. The piercing rays of the sun on the Sun Temple at Konaraka are the shooting arrows of *Usha* and *Pratyusha.* Goddess Durga was presented the bow, arrow and quiver by the *Marut.* Another manifestation of Siva is *Virabhadra,* who has one head, thirty two hands, three eyes and matted hair. In one of the sixteen hands on the right side he holds bow and arrow.

Prithviraja Chauhan (according to *Prithviraj Raso*) was an archer *par excellence* who adjudged the distance correctly from sound and his arrow could penetrate seven metal bells. Archery as a game was popular with the Mughals as well. They practised it by raising a mound of earth and shooting a certain number of arrows daily Nadir Shah used to shoot five arrows into the same target every afternoon.[10]

Arrows were used for witchcraft also. Prophet Mohammed had forbidden their such use, [11] but the practice survived. Humayun had marked his arrows with witchcraft against his host Shah Tahmasp but had an adverse effect which killed him ultimately.[12]

Native archers rarely missed their aim even if it was as small as the size of a tea-cup placed at a distance of sixty or seventy yards. Captain Williamson often witnessed such shows. The hill people of Bengal were experts in this. They would lie

Plate VI



MATSYA—BHEDA,
MEWAR, 1699 A.D.

(Collection : National Museum, New Delhi.)

on their back, steady the bow horizontally with their feet and send the arrow through a water-pot kept at a distance of three hundred yards. They could even shoot kites and butter-flies flying in the air and rarely missed the object. Even today we sometimes come across persons quite skilled in this art who could perform many wonderful acts with the bow and arrow.

References

1. Jeannine Auboyer : *Art and Letter,* Vol. XXV, No. I, 1955, p. 3.
2. *Mahabharata* : I (Poona Edition 1933), CXXIII, 12-18.
3. Marshall : *Taxila,* Vol. II, p. 664.
4. J. Hackin and others : *Nouvelles recherches arche-ologiques a Begram* (Paris, 1955)
5. *Sathpatha Brahmana* : V, III, p. 527.
6. *Milindpanho* : VI, 9.
7. *Sathapatha Brahmana* : *Op. cit.,* 530.
8. Jeannine Auboyer : *Op. cit.,*
9. *Ibid.*
10. James Fraser : *History of Nadir Shah,* p. 143.
11. Sale : *Preliminary discourse,* Section V, *Holy Quran* V.
12. Eraskine : *Babar and Humayun,* ii, 289.
13. Irvine : *The Army of the Indian Moghuls* (1962), p. 99.

THE INDIAN SWORD

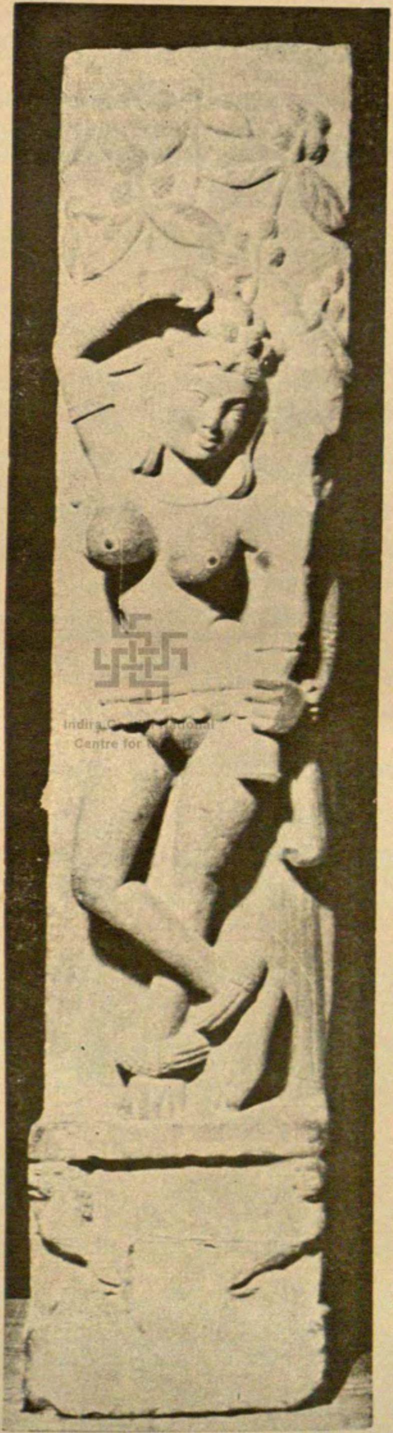
Sword is an important accessory in the Indian armoury. It is a hand-weapon with a blade of metal of varying length and a small grip to hold it. It is different from the thrusting weapons like spear javelin, pike, etc, and the properties like arrows, etc., in as much as in these varieties of weapons the blade is short and forms either only a small portion of the effective length or fixed to a shaft.[1] The origin of Indian sword is rather obscure. A mythological story is given in the *Mahabharata* where Bhisma narrates that this weapon was born out of a meteor like lotus which emanated from a sacrifice performed by Brahma to vanquish the Asuras.[2]

The evolution of the sword can be traced from the remote past. The flint daggers, knives and celts of the Upper Paleolithic period (c. 16000 B.C.) and the spear-heads of the Neolithic period (c. 3000 B.C.) may be taken as the proto-types of copper and bronze swords.[3] In early weapons it is difficult indeed to distinguish between the spear-heads and the large knives and swords. The affinity between them is very close. Even Mackay has admitted that No. 3 in his Pl. CXIII which is a spear-head of Harappan culture has been included into the category of sword simply because of its long tang and unusual length.[4]

John Marshall has clearly stated that the sword, which becomes the characteristic weapon of the later copper age in the Ganga-Jumuna Valley, was not available in the Indus cultures, but on the other hand Mackay suggests that some of the long blades should be best described as short swords because, 'Judging from their rather blunt point and general shape it was probably used for slashing rather than thrusting."[6] I am in agreement with him. A representation, No. 3 in Pl. CXIII (also Pl. CXVIII Fig. 9) of Mackay is a long, narrow, copper weapon 15.75″ in length and 0.4″ thick, rivetted at the junction of the tang with the blade. This seems to be in an unfinished state. A copper sword No. 9 of Pl. CXIX (also No. 17 of PL CXX of Mackay) measures 18.5″ in length and 0.48″ thick It converges gradually and evenly towards a point. We may take the copper castings illustrated in Pl. CXI-19 and CCCVIII-5 of Mackay, also to be parts of an unfinished sword.

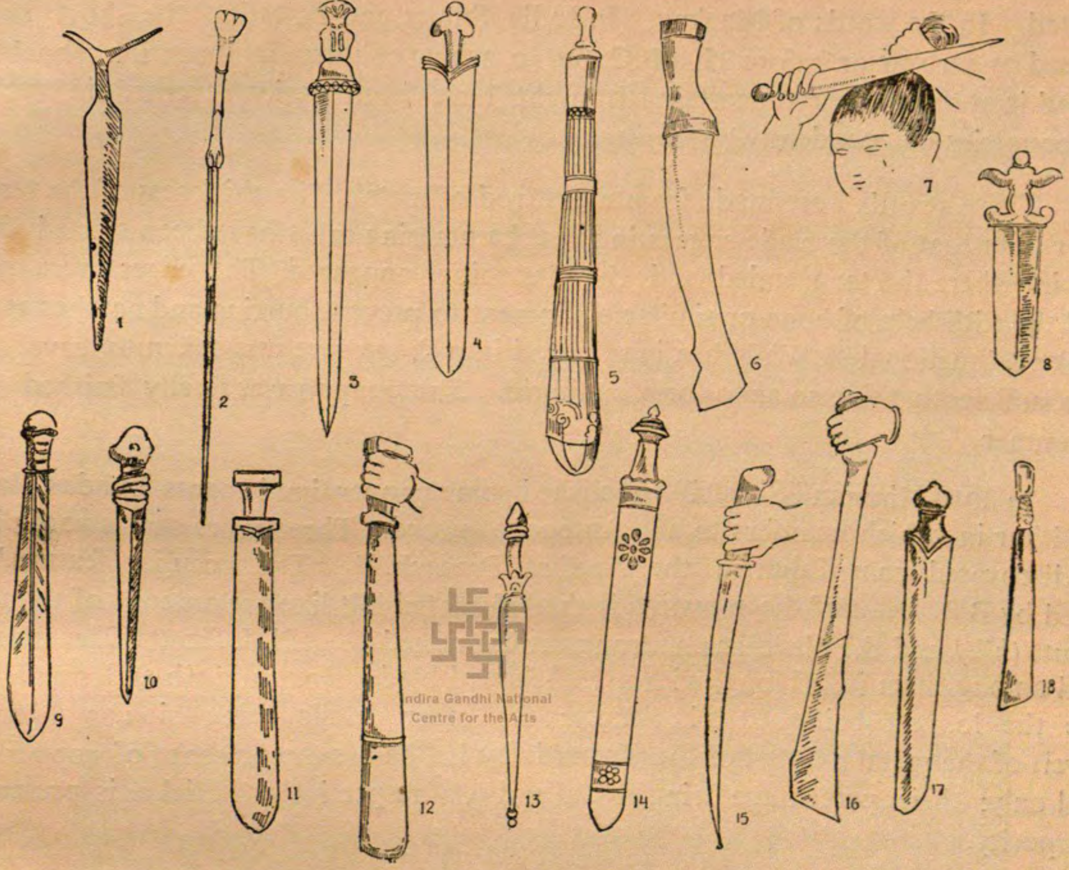
The weapons having long tang should not necessarily be taken as thrusting objects—its main function was that it should be fixed in the shaft to hold the weapon firmly. A few such pieces, outside India, have been brought to our notice. One example is at Sumer at Telloh[7] which is 16 1/4″ long and a weapon of similar type but of

Plate VII



SWORD DANCE,
MATHURA, KUSHAN, 2nd Cent. A. D.

(Collection : National Museum, New Delhi.)



Swords through the ages

1. Antennae, *c.* 2000 B.C.

2-3. Fort Monroe Swords, *c.* 1200 B.C.

4. From Bharhut Sculptures, *c.* 2nd century B.C.

5. Sword of Kanishka (from Sculpture), *c.* 1st century A.D.

6-8. Gupta swords (from Sculptures), *c* 4th-5th century A.D.

9-10, South Indian swords (from Sculptures), *c.* 10th century A.D.

11-12. Orissan swords (from Sculptures), *c.* 11th century A.D.

13-16. Mughal swords (from Paintings), *c.* 17th century A.D.

17-18. Tribal swords (Modern)

later age has been found at Egypt.[8] It is very difficult to say that swords in India were imported. In the words of Mackay, "In India, Sumer and Palestine the short sword was used as early as or before 2500 B.C. but to what country its invention should be ascribed is at present very uncertain—it might have been easily invented in each of these countries independently."[9]

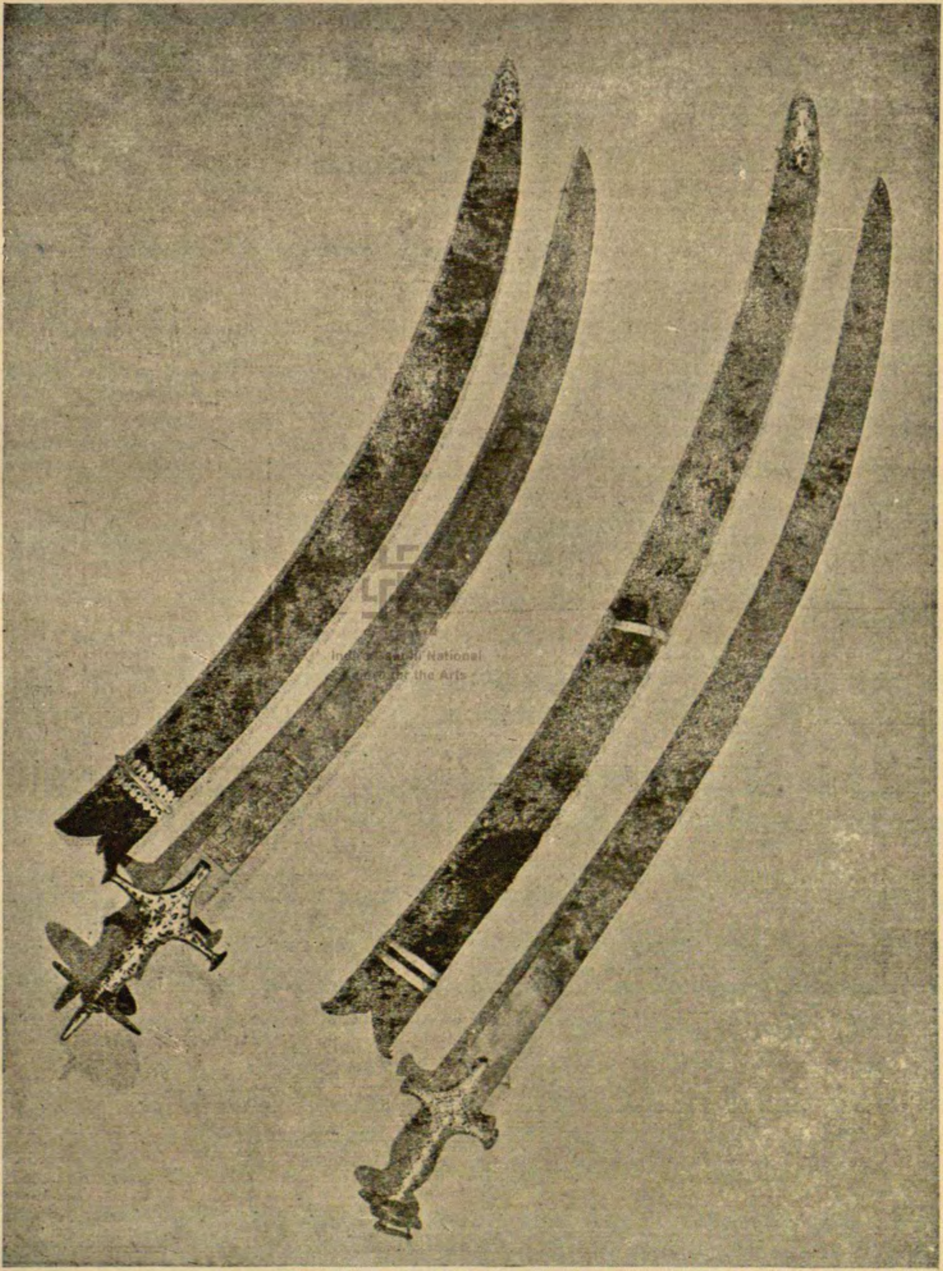
These swords were made from a cast rod of metal. The thickness of the tang is greater than that of the blade suggesting that hammering must have been started from the point where the tang ended and the flattening appeared. The edges were sharpened the with help of hone or similar equipment to prevent burring and notches as also to make it functional.[10] While beating the rod into shape care was taken to leave axial centre sufficiently thick so as to form a mid-rid. The weapon was finally finished with the hammer.

In 1915 Hiranand Shastri[11] published some copper implements found at Hardoi and Bithur in which he refers to an Antennae sword. Three more such swords have been discovered from Kallur in the Andhra Pradesh.[12] "The peculiar feature," as defined by B.B. Lal, "of these swords is the bifurcated hilt like the antenna of an insect, the butt *(hilt)* and the blade has a strong medial-ridge."[13] (Pl. I, fig 1). The smallest sword among them is 12″ long, with a leaf-shaped blade, stout mid-rib and small tang while the longest being 20½″ in length; the other details being similar. Chemical analysis of the metal content of these swords by Lal shows the presence of copper and nickel only; their percentage being 98.43 and 0.66 respectively.[14] Nickel is present as an impurity.

The well-known sword of bronze from Fort Monroe in the Punjab can be regarded as authentic specimen of a sword in its real sense. It exhibits some West Asian traits. It can be dated to *c.* 1200 B.C.

Swords were made in large numbers in the Iron Age. In the *Yajurveda Samhita* (*c.* 1000 B.C.) distinct mention is made of the use of iron and iron weapons. Iron came much later in use simply because the meteoric iron could not prompt any enquiry to the iron ore of the earth and secondly "experimental smelting of iron would be most discouraging because pure iron melts at 1535°C (compared with 1083°C for copper).[15] Though, in the beginning, iron was used mainly for ornaments but as time passed it came to be used for manufacture of swords, daggers, spears and other weapons Probably in no other country iron was found more abundantly than in India and once the utility of this metal was proved over that of copper and bronze, Indians had little difficulty in obtaining supplies of the metal. From the very early period India

Plate VIII



CURVED AND INSCRIBED RAJPUT SWORDS,
RAJASTHAN, LATE 17th Cent. A. D.

(*Collection* : *National Museum, New Delhi.*)

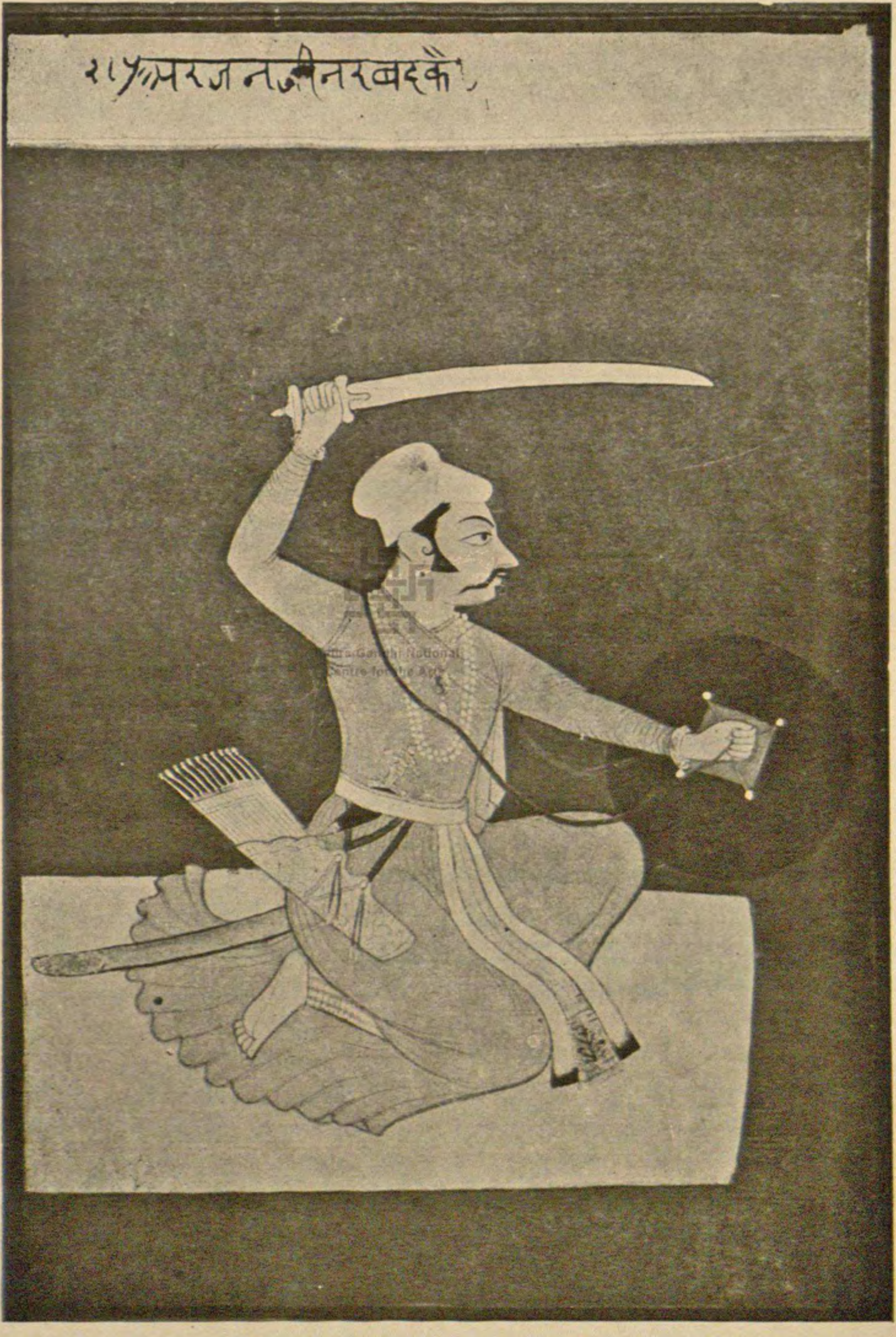
has been famous for its iron and steel. Prior to the invention by Huntsman of Handsworth about 1770 A.D. of an improved process of manufacture of steel,[16] best steel was made by the Hindus and had cost as much as Rs 10,000 a ton. Ktesias (5th century B.C.) mentions two swords made of Indian steel presented to him by the King of Persia and his mother. The *'FERRUM CANDIDUM'* which was presented by the Malloi tribe to Alexander the Great has been regarded of the same quality of metal (4th century B.C.). Periplus informs that in first centry A.D. Indian steel was exported from Africa to Abyssinia and Salamsuis speaks highly of the *temper* of Indian steel.[17]

The sword falls under the *amukta* category according to *Dhanurveda*,[18] since it is never separated from the grip. It is known by different names in Sanskrit literature, such as *nistrimsa* (cruel), *vishyan* (fearful), *knanga* (powerful), *sri-garbha* (affording wealth), *tiksnadhara* (sharp), *durasad* (unassailable), *vijaya* (giving victory) and *dharmamula* (maintaining *dharma*). These names have been given on the basis of the characteristics of the sword. The sword was commonly worn on the left side and is associated with thirty-two movements. "Its presiding deity was *Agni*, it belonged to *Rohini* community and its first preceptor was *Rudra* himself."[19] A good sword should be of iron of the colour of Cuckoo's neck. The blade should be like a petal of lotus, deep inside, bulging in the middle, sharp-edged and with no blots. The best variety sword measured 50″, the middle 46″ and the lowest 36″. They were generally made of *pandrara* iron found in the *Jangala* country, of black iron in the *Anupa*, of white iron in the *Satharna*, of gold coloured iron in the Kalinga and of oily iron in the Kamboja. Those made in *Khati* were famous for their lustre, those of *Kaisika* for power in felling, of *Suiparaka* for durability and of Vanga for sharpness.[20] Oppert has tried to take '*Isu*' for sword but it should better be taken for arrow as suggested by Dikshitar. Tradition has it that all these *mukta* and *amukta* weapons numbering thirty-two were made out of the bones of *Dadhichi* which indicates the use of bone for swords as well. Even today swords with hilts of bones are frequently available. In the *Ramayana*, the Buddhist chronicles and other Sanskrit works sword has been mentioned at several places. Kautilya[21] has mentioned *nistrimsa*, *mandalagra* and *asyasthi* as the varieties of the sword. *Nistrimsa* was a sword with crooked hilt, *mandalagra* was straight and provided with a disc at the top and *asyasthi* was very sharp and long. The hilts of swords were made of the horns of rhinoceros and buffaloes, of the tusk of elephant, of wood or of the bamboo roots. As for the sword of Mauryan period Megasthenes says, that all wore swords of vast breadth though scarce exceeding three cubit in length, when they were engaged in close fight they grasped these with both hands.

Figures of swords do not appear even once on the Punch-marked coins and I have not come across any sword symbol even on the Tribal coins, although trident, standard, sceptre, staff and spear are found. In numerous Indo-Scythian coins both straight and curved swords are visible.[22] In the sculptures from Bharhut and Sanchi assignable to the Sunga Period representations of swords, both straight and crooked variety, are to be found. The warrior on a Bharhut sculpture (2nd century B.C.) is shown having a double-edged straight sword hung from a belt. The scabbard is also seen. The hilt does not have a quillon which indicates that quillon was a later innovation. In the Sanchi sculptures the soldiers wear tight fitting dress and their swords are on the left side. Apparently the swords were short but very broad. In a pillar of Amaravati, we notice a straight sword which has close similarity with those seen in the sculptures of Orissan caves (5th century A.D.). Most interesting is the sword of the Kushan emperor 'Kanishka' (1st century A.D.) as seen from the broken sculpture which is straight, double-edged, sufficiently long and broad at the lower end.[23] On a railing pillar from Mathura, (Kushana, 2nd cent. A.D.) a lady is seen performing the 'Sword-dance' holding the slightly curved, naked and broad sword. This would be of the *khanda* variety. (Pl. VII) During the Gupta period sword attained its full-fledged development. A sword is seen hanging from the belt in some battle-axe type coins of Samudragupta.[24] In one coin of the same type a sword is seen suspended from the armpit In a '*Chakravikrama*' type of coin the king is extending the right hand to receive the divine gift while the left hand is placed on the hilt of a sword hanging along the left leg.[25] The sword is fastened by a strip or belt to the king's waist which passes through a hole in the hilt. Both in the 'Archer' type class II, variant D and 'Horseman' type class II, variant E, coins of Chandragupta II, the sword is noticed.[26] In the 'Rhinoceros-slayer' type, king Kumaragupta is attacking the animal with a sword and the inscription runs : '*Bharta Khangatrata Kumaragupta Jayatyanishan*''. Even during the reign of Skandagupta and later Guptas sword was very popular [27] Harisena in the Allahabad Pillar inscription also mentions that Samudragupta's body was decorated with the wounds caused by the blows of battle-axe, arrows, swords, etc. Several specimens of sword can be seen in the sculptural masterpieces of this period. In one of them a leogryph showing a mounted warrior, a beautiful sword is engraved with straight quillon, round pommel and a knob at the top. In the sculpture showing scenes from the Buddha's life, Buddha is shown cutting his hair with a pointed sword. In a sculpture from Deogarh Lakshmana has been depicted as disfiguring Surpanakha with a sword In another sculpture a man fighting a leogryph a broad sword with round pommel can be seen.

In the sculptures of the Pala and Sena periods beautiful representations of swords are available. In a Gandhara (2nd century A. D.) sculpture now in the Central Museum

Plate IX



PORTRAIT OF A SWORDSMAN,
BUNDI, EARLY 18th Cent. A.D.

(Collection : National Museum, New Delhi.)

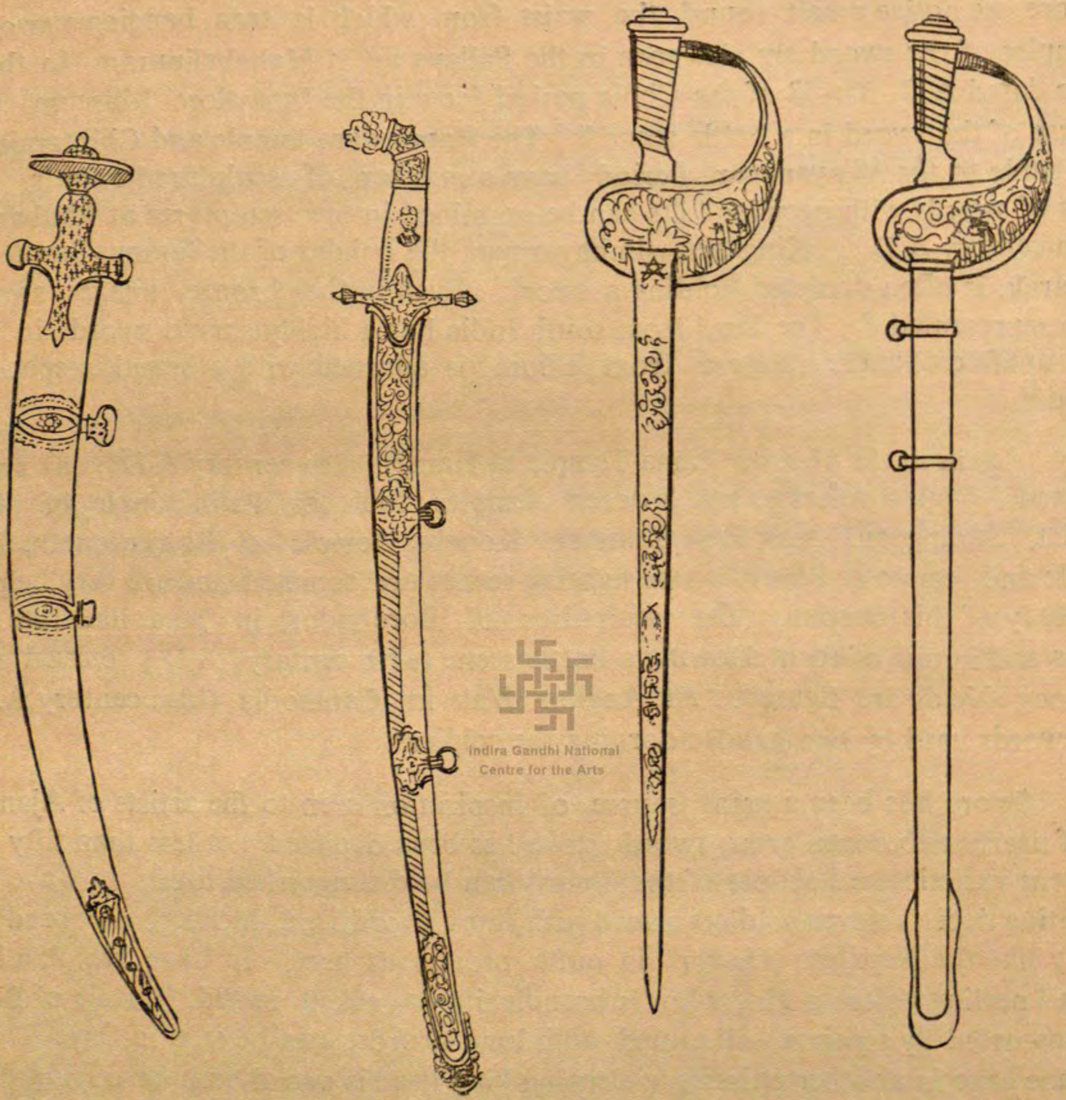
Lahore, we notice a belt round the waist from which is seen hanging a sword. Fine examples of the sword are also seen in the Pallava art at Mahabalipuram. In the *Begur* stone dated A.D. 931-38 of the Chola period (now in the Bangalore Museum) we find the use of the sword in a battle scene.[28] The Rameswara temple and Chintaraja temple ascribable to the Vijayanagar Period have a number of sculptured swords. Several types of swords with peculiar hilts can be examined in the sculptures at Bhubaneshwar (10th century A.D.). King Narasimhavarman, the builder of the famous Sun temple at Konarak, is often depicted holding a sword. Even in the bronze images swords are often represented.[29] The Devi from south India has a highly curved sword in one of her uplifted hands. Natesa from Ellora is adorned with a beautiful specimen of sword.[30]

Again in the Hazara Rama Temple at Hampi (15th century A.D.), a sword is depicted. Oppert refers to half a dozen temples such as Patin temple of Madurai district, Sarangpani temple at Kumbha Konam, temple at Conjeewaram, Tanjore temple and temple at Perur, where fighting scenes are depicted and are very helpful in our study of this weapon. The sculptures of Borobudur in Java, illustrate *Jataka* scenes and in one of them showing a battle scene (11th century A.D.) curved swords and long shields are figured. At Angkor Vat in Cambodia (12th century A.D) we find swords used by two hands adorning the soldiers.

Sword has been a great source of inspiration even to the artists of Ajanta and out of nearly two dozen arms, sword alone has been depicted not less than fifty times. Different varieties and shapes of the sword can be distinguished here. In Cave No. 1, a painting depicts eleven soldiers armed with short swords and shields.[31] A broad sword exactly like the Nepalese *khukari* is quite prominent here. In Cave No. 2, a lady is shown kneeling before a king who is brandishing a naked sword.[32] Raja of Benaras being escorted by soldiers, all armed with long swords, can be seen in Cave 17.[33] In the same cave in another painting a sleeping king has his sword and belt lying by his side is seen .[34] In the series of paintings *Saudsman* with his sword puts to heel a whole army of elephant riders, horsemen and infantry and the panic caused by his valour is continued even to the next panel.[35]

Thus several varieties of swords, long and short, curved and straight, with or without scabbard, with double-edge, straight quillon, round pommel, blank sheath, metal covering for the lower portion of the sheath, etc., besides, sword-belt, etc., are depicted here. Such other specimens as *khukari*, *chopper*, *dao*, *khanda*, *khadga* which more or less fall within the category of sword have been painted with great confidence.

Several specimens of swords are painted in almost all miniatures of Mughal,



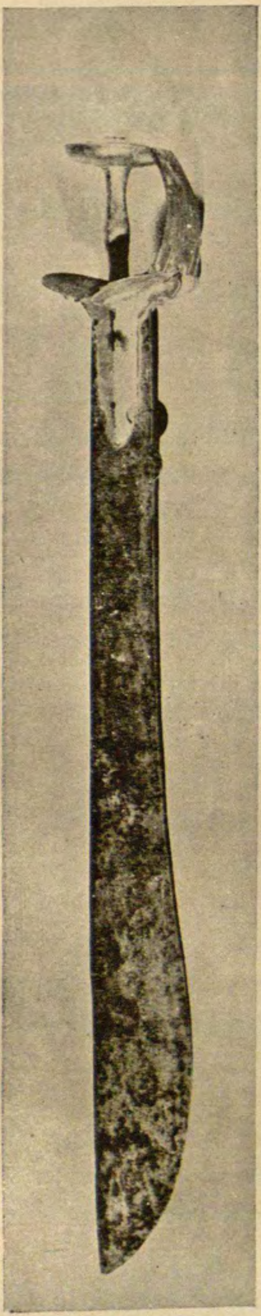
Swords from Miniature Paintings (Early 17th to Early 18th cent. A.D.)

Rajasthan, Deccani, Pahari and Company schools. In one painting of Bundi School datable to early 18th cent. A.D. a man has been shown holding a naked sword (Pl. IX).

In spite of the wide use of artillery, sword continued to be an important weapon of offence and a mark of distinction throughout the Mughal regime. In the *Zafar Nama*, a work of the time of *Timur*, Egyptian swords are mentioned and the *tegha* is also given due credit. A manuscript of *Babar Nama* of late 16th century, now in the National Museum, New Delhi, depicts several types of swords such as straight, curved, *tegha*, *khanda*, etc. Sword was sometimes used for hunting purposes also and on page

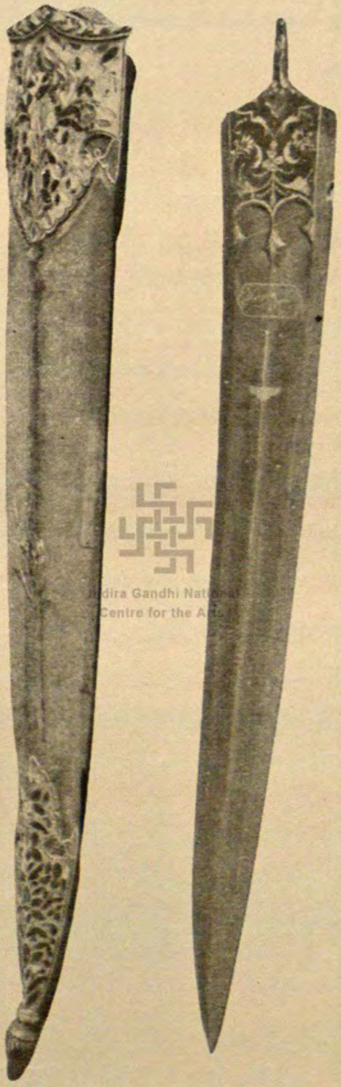
Plate X

Fig. 2



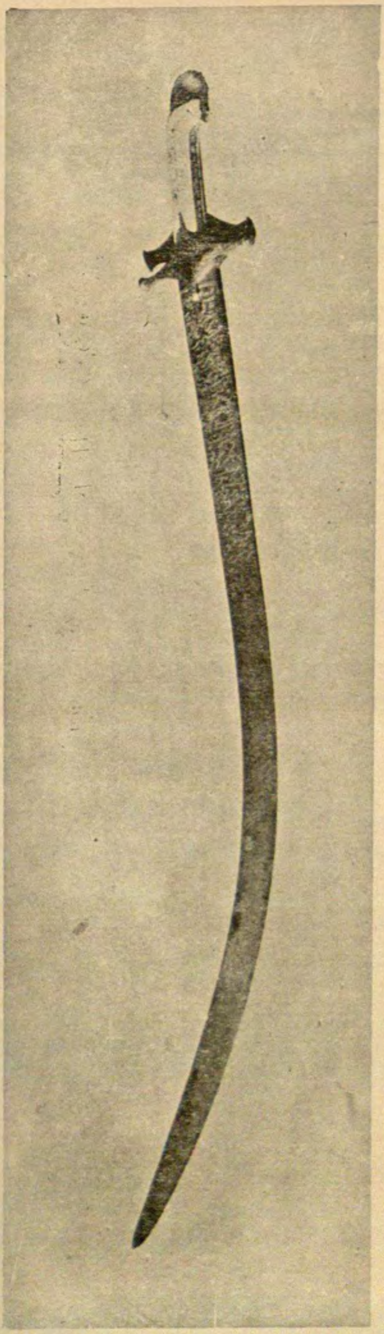
Inscribed Khanda of Aurangzeb
with knuckle guard,
Mughal, C. 1680 A. D.

Fig. 1



Dagger of
Aurangzeb,
Mughal, C. 1680 A. D.

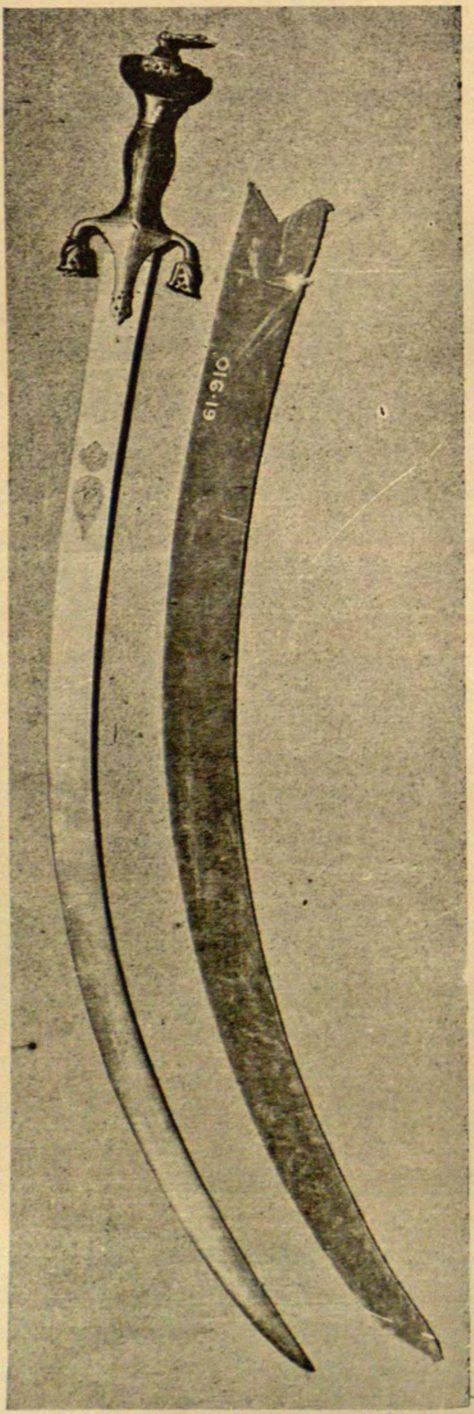
Fig. 3



Inscribed Sword of Aurangzeb
with Irani Hilt
Mughal, C. 1700 A. D.

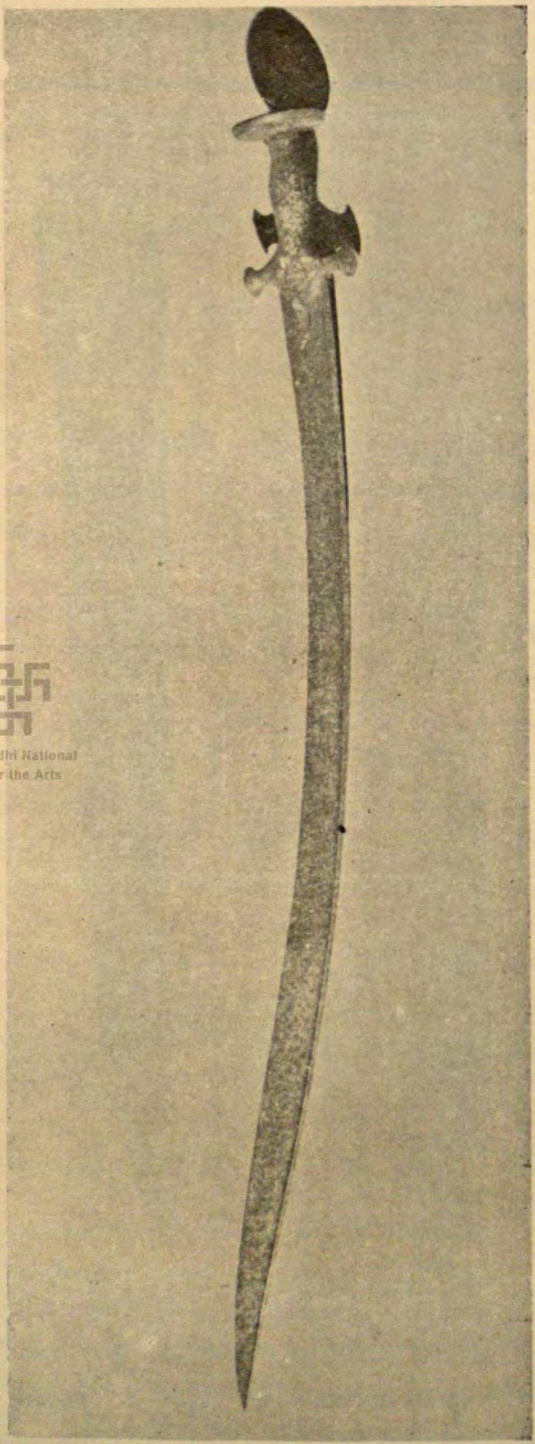
(*Collection* : *National Museum, New Delhi.*)

Fig. 1



SWORD WITH ARBI HILT,
MUGHAL, C. 1775 A.D.

Fig. 2



SWORD WITH GILOTA HILT,
DELHI, C. 1775 A.D.

(Collection : National Museum, New Delhi.)

193 of *Babar Nama* we see a deer being killed with a sword. The waist-swords of the time of Humayun are referred to in the *Humayun Nama.* In such swords Persian influence is discernible The best Muhammadan blades are engraved with the verses from the Quran or praises of Ali. Several of these weapons were made by Asadulla, the most noted craftsman of the court of Shah Abbas the Great, of Persia (about A. D. 1585). The "roaring tiger" should be taken as the trade mark of Asadulla and is seen on all the genuine swords.

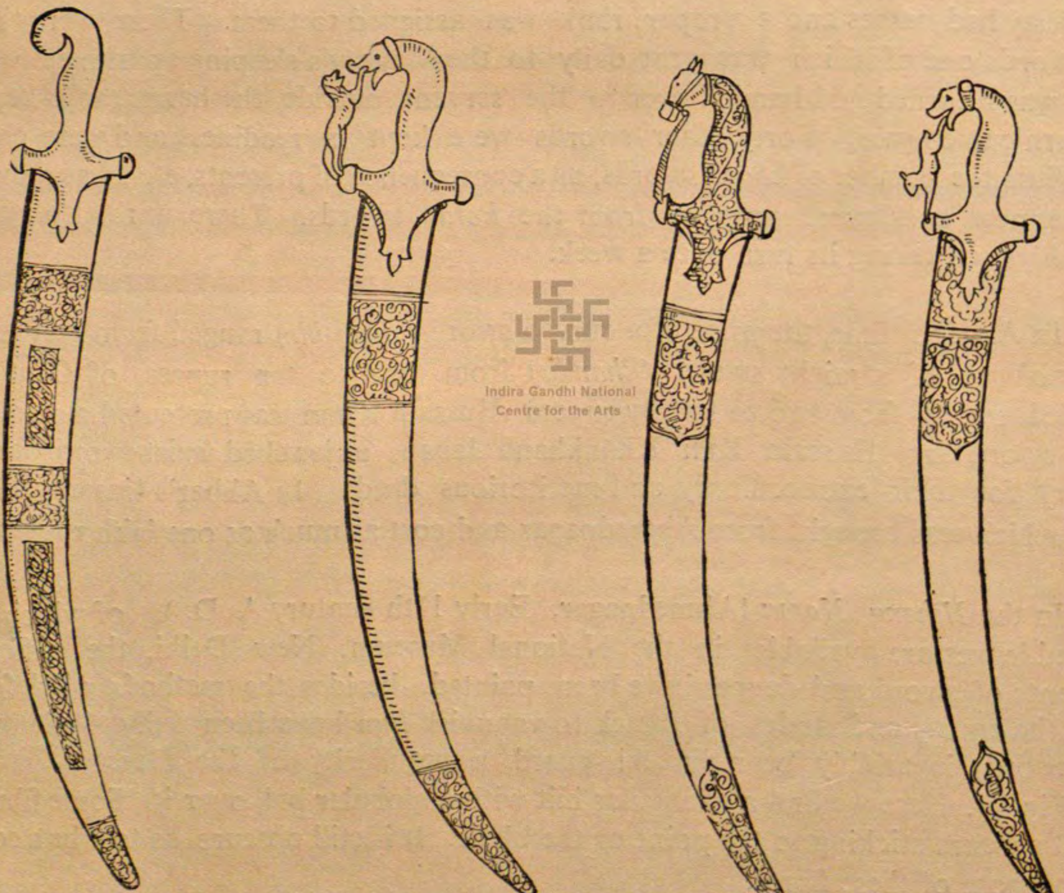
In the *Ain-i-Akbari,* Abul Fazl mentions that all the weapons for the use of His Majesty had names and a proper rank was assigned to them. There were thirty *khasa* swords one of which was sent daily to the Majesty's sleeping apartmeut. The old one was returned and handed over to the servant outside the harem, who kept it till its turn came again. Forty other swords were kept in readiness and were called *kotal.* When the number of *khasa* swords, as a consequence of presents, etc., was reduced to twelve, new ones were supplied from the *kotal* swords. There were also twelve '*yakbandi*' each taking its turn once a week.

In Akbar's time, the price of a curved sword *(shamshir)* ranged from half rupee to 15 *mohurs,* of straight sword *(khanda)* from one to ten rupees, of *Gupti-asa* (concealed sword) from two to twenty rupees. Hussain Khan was presented a crescent-shaped sword and Hussain Kuli Khankhana Jahan, a jewelled waist-sword *(kanak shamshir)* for their extraordinary and meritorious deeds. In Akbar's treasury was a sword, which was brought from Ahmednagar and cost as much as one lakh rupees.

In the *Nihang Nama* (Ahmednagar, Early 17th century A. D.), of which few illustrated leaves are available in the National Museum, New Delhi, the different movements of sword and dagger have been painted, besides the methods of defence against the enemy and modes of attack to vanquish him have been fully dealt with. These swords invariably bear knuckle-guard, a peculiarity of the Deccan swords (Pl. X, Fig. 2). Here we find a triangular hilt with a globular ball over it. Some fibrous material appears sticking to the point of the blade. It is still obscure as to what could be the purpose of these fibres.

Nur Jahan presented a sword with jewelled shoulder belt *(pardal)* to Shah Jahan in recognition of his distinguished services in the field of battle[36] Once Shah Jahan presented a short but broad sword *(Shamshir-i-nimchaye)* to Jahangir[37] of which the hilt and fastenings were made of watered steel bearing a royal insignia and an inscription.

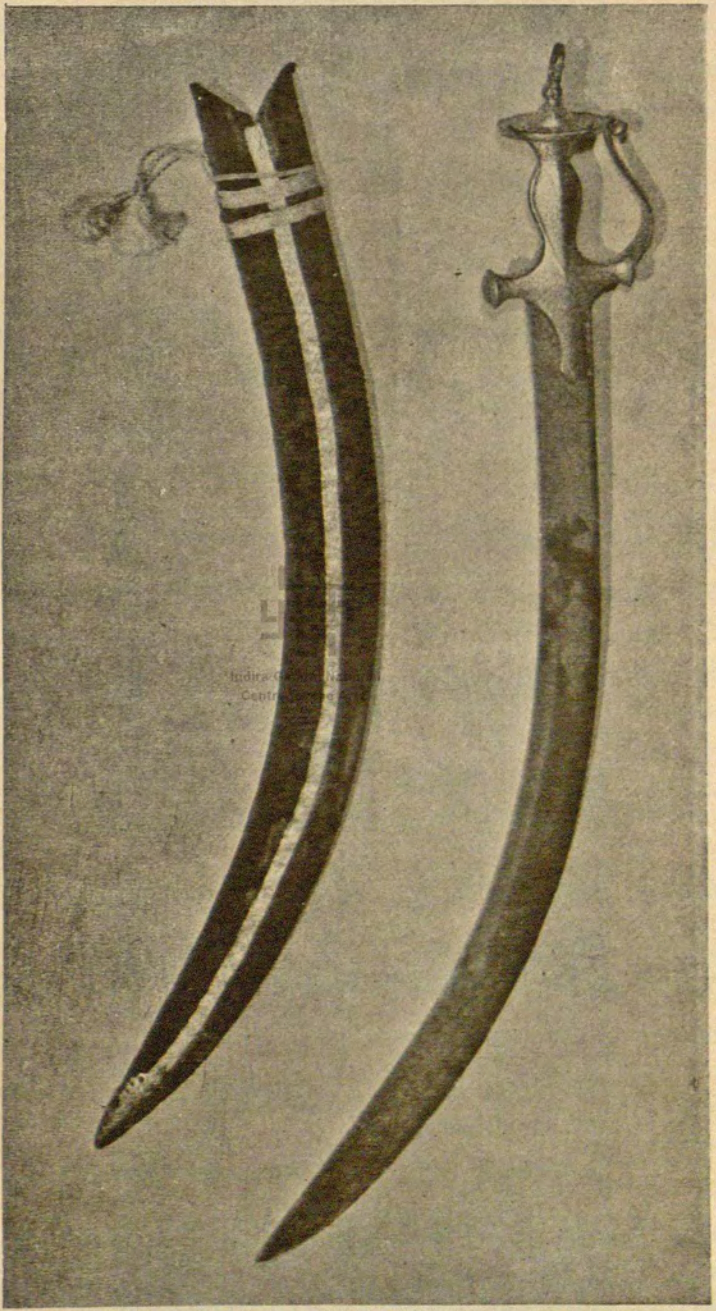
Once Jahangir had ordered Ustad Daod to make a sword and was named *Shamshir-i-kati* (sharp sword)[38]-Mughal swords are four fingers broad, very thick and by consequence heavy. They are crooked a little, very plain and commonly no more but a handle of iron with the cross—bar of same underneath the pommel which is also of iron is neither round nor oval but flat above and below like a whirligig that the swords may not slip out of their hands when they fight”[39] (Pls. X-XI). Pommels were round, square and oval. Ivory, jade, soap-stone, etc. have also been used in this period for pommels.



MUGHAL SWORDS

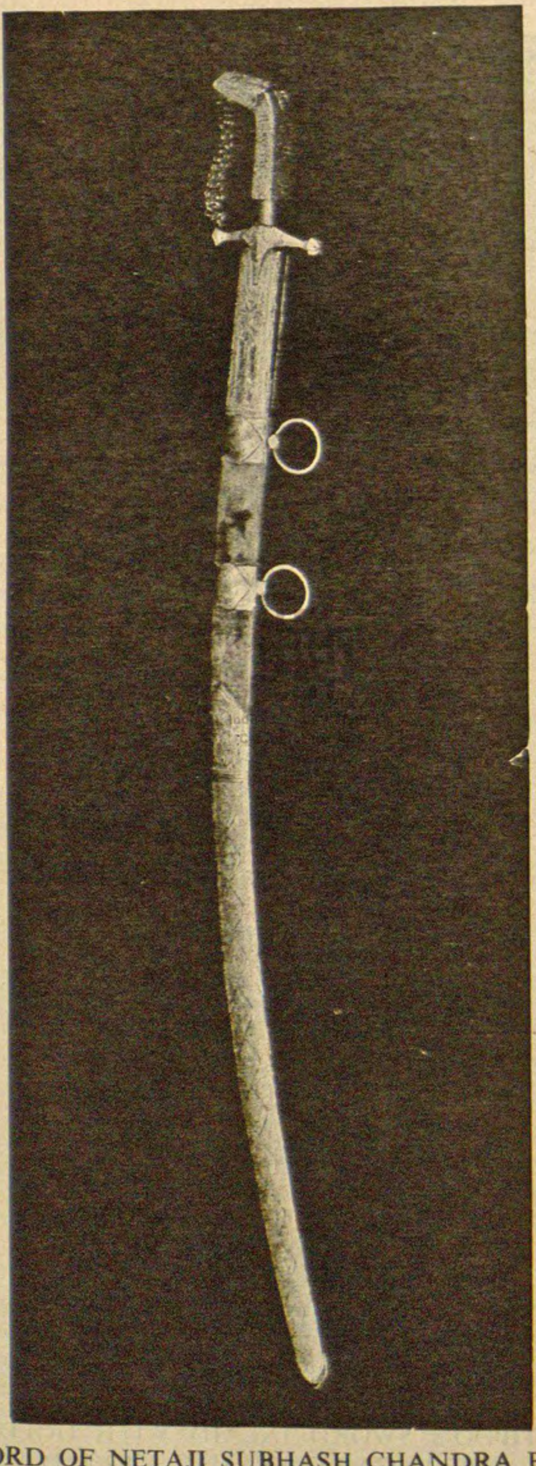
1. Hilt of crystal.
2. Hilt of metal.
3. Hilt of Jade.
4. Hilt of steel.

Plate XII



TIPOO'S SWORD INLAID WITH GOLD,
SRIRANGAPATANAM, C. 1799 A. D.

(*Collection : National Museum, New Delhi.*)



SWORD OF NETAJI SUBHASH CHANDRA BOSE
(Presented To The National Museum, New Delhi
by Late Sri Jawahar Lal Nehru)

As many as twenty seven names have been given to swords by Manucci : *Dushman-Kush* (killer of enemies), *Alam-Sitan* (world conqueror), *Fateh-Lashkar* (army-vanquisher), *Kamar Jeb* (waist-adorner), *Yare-Vafadar* (faithful friend), etc. One sword called *Alamgir* was sent by Shah Jahan to Aurangzeb after he won the battle of Samugrah. Two swords of Aurangzeb were discovered by the author out of the five thousand weapons received in the National Museum, New Delhi, as a result of the Hyderabad Police Action in 1948 (Pl. X. fig 3). The use of a sword was not confined to Northern India only. In the Deccani school of paintings several examples can be seen. The most remarkable is the portrait of Malik Amber holding a long sword. It would not be out of place to mention two other historical swords, one of Nadir Shah bearing date equivalent of 1739 A.D., and the second of Ahmad Shah Abdali of 1761 A.D., both of which are displayed in the Gallery of Arms, National Museum, New Delhi. In the same gallery is displayed the sword of Tipoo Sultan (Pl X. fig. 1) while that of Subhash Chandra Bose is also preserved here (Pl. XIII).

Rajasthan has produced everything necessary for carrying on war. The blades of Sirohi and damascening of Jaipur are famous since time immemorial. Swords of several varieties are mentioned in the literary accounts of Col. Tod and depicted in the paintings of the Rajput school (Pl. XVI). Generally, these swords have their edges on the convexity and are broad and strong. Sacrificial swords, often large and used by both the hands, are long and broad with a blunt or bifurcated point. Specimens of both the kinds can be seen in the National Museum, New Delhi. The Rajputs never fenced, so their swords are generally not pointed. The Nepali *Khukari*, the gauntlet swords of the Nagas, Persian *Samshir*, Maratha *Zafar Takiya* and the fire-arms of the Britishers were successfully adopted by the Rajputs.[40]

The sword was commonly used by the Marathas, who depended mostly on it. These swords were generally of good tampered steel[41]

The Sikhs were excellent swordsmen. The sword finds mention in the *Dasam-Granth*[42] *Khanga* was an important weapon which was kept before the shoulder.[43] *Khanda* has attained religious importance due to its association with Guru Gobind Singh's life (*Khande-ka-Pahol*). *Kirpan* is more or less a sword in itself and has been included in the five *Kakars*. Some other varieties such as *Asi*, *Samshir*, *Tegha*, *Kirich*, *Kati*, can be noted. Most of the Sikh period-arms have been displayed in the Patiala Museum, Patiala, Punjab. In the court of Ranjit Singh, swordsmen were honoured and Hari Singh Nalwa, the General of Ranjit Singh, has been often portrayed holding a sword. A special type of sword was known as *Fank* having a crescent-headed curved blade and a handle to hold it. In one of the drawings of about 1825-50 A.D., Raja Moti Singh of Poonch has been portrayed with a curved sword with double pommels.

Even today some of the tribes use swords. The swords of the *Adis* are straight and edged and the grip is carefully covered with plaited cane strips.[44] The other end of the blade is narrow, blunt and curved. These swords are always carried in wooden scabbards and slung from a belt made of *Mithun* hide. The most interesting sword of NEFA is *Dao* which is narrower towards the haft and broad towards the tip. *Daos* have heavy blade, are single-edged and without points. The blade has a tang which is inserted in a wooden handle. The Nagas use the large gauntlet swords The *Tharoo* tribe of Uttar Pradesh prefer Nepali *Khukari.*

Indian sword-hilts are of various forms. In the earliest sword we have the bifurcated hilt like the antenna of an insect (Pl. I). The hilts in the beginning were long and without quillon. The conical and square hilts are later innovations Crescent-headed hilt was popular in the 1st. century A.D. During the Gupta period the hilts were circular, triangular, globular and with or without quillon. In the medieval period one more addition, that is, the knuckle guard, which was attached only to heavier weapons, was made. Rajput, Maratha and Sikh swords are generally provided with it. In some cases, basket hilts are padded and pommels are covered with wire to give them a firm hold. Iranian and Persian hilts are the common features of the Mughal swords The horse, ram, dog, elephant and lion shaped hilts are also available. The swords of Delhi are enamelled and have small *Gilota* hilt (Pl. XI, fig. 2) while those of the later Mughals have *Shah Jahani* hilt.

Through the centuries the sword has been the forerunner of the weapons of war. Even in the context of modern atomic weapons the study of its evolution and development is not without significance The various forms and shapes of the sword with its blade, hilt, scabbard, curvature, inscription, designs, styles, etc., help us in determining the period of different categories of art objects wherever the sword is depicted. The swords preserved in the different Museums and private collections present before us a saga of the chivalrous deeds of the heroes who sacrificed their lives in defending their motherland against the onslaughts of the enemy. It is by the power of the sword that great empires were built or raised to dust. Even today this weapon is held in high esteem by the heroic clans of the Rajputs, the Sikhs, the Gorakhas, etc., who ceremoniously worship the power bestowed to this weapon on some festive occasion like Dussehra.

References

1. *Encyclopaedia Britannica,* Vol. 21, page 692.
2. P.C. Roy, *Apadharma of Shantiparva* of *The Mahabharata.*
3. Michael Nesturkh, *Origin of Man.*
4. E J.H. Mackay, *Further Excavations at Mohen-jo-daro*, Vol. 1, page 459.
5. John Marshal, *Excavation at Mohen-jo-daro & the Indus Valley Civilization.*
6. Mackay, *op. cit.*, p. 466.
7. Heuzeb, *Deconvertees on Chaldee*, Vol. 1, p. 386.
8. Petrie, *Tools and Weapons*, Pl. XXXII, Fig 40.
9. Mackay, *op. cit.*, p. 467.
10. *Ibid.*
11. Hiranand Shastri, *J.A.S.B. (New Series)*, XI, pp. 1-16.
12. *An. Rep. Arch. Deptt. H.E.H. Nizam's Dominions* 1937-40, Pl. V.
13. B.B. Lal, *Ancient India*, No. VII, p. 35.
14. Quoted by B.B. Lal in *Ancient India*, No. VII, p. 34.
15. Durbey and Williams, *A Short History of Technology.*
16. Ramsay Muir, *A Short History of British Commonwealth*, Pt. II.
17. John Marshall, *Taxila*, Vol. II, pp. 44-5.
18. Khsemraj Shrikrishandas Srest (ed.), *Dhanurveda Samhita.*
19. Dikshitar, *Art of War in Ancient India.*
20. *Ibid.*
21. T.G Shastri (ed), *The Arthasastra of Kautilya.*
22. R B Whitehead, *Catalogue of coins in the Punjab Museum*, Pls. VII, IX, XIII and XVII.
23. K.M. Munshi, *Saga of Indian Sculpture.*
24. Altekar, A.S., *Bayana Hoard*, p. 50.
25. *Ibid.*, p. 208.
26. *Ibid.*, pp. 157 and 191.
26. *Ibid.*, p. 296.
28. Dikshitar, *op. cit.*
29. C. Sivaramamurti, *Indian Sculptures.*
30. K.M. Munshi, *op. cit.*
31. Yazdani, *Ajanta*, Part I, Pl. XXXVIII, p. 46.
32. *Ibid.*, Part II, Pl. XLV, p. 50.

33. *Ibid.*, Part IV, Pl. XII (D), p. 33.
34. *Ibid.*, Part IV, Pl. XX (C), p. 55.
35. *Ibid.*, Part IV, Pl. XXVIII-XXXVII, pp. 54-65.
36. W. Irvine, *The Army of the Indian Moghuls*, p. 75.
37. *Ibid.*, p. 76.
38. Abdul Aziz, *Military Administration of Mughals.*
39 Quoted by Abdul Aziz.
40. Thomas H. Hendley, *Memorials of the Jaipur Exhibition.*
41. Tone, *Illustration of some Institutions of Maratha people*, pp. 47-48
42. Guru Gobind Singh, *Shastra Nama Mala* in *Dasam Granth.*
43. Bhai Kahan Singh, *Guru Sabda Ratnakar Mahakosh.*
44. Sachin Roy, *Some Aspects of Padamiyang Culture.*

REPRESENTATION OF WEAPONS ON ANCIENT INDIAN COINS*

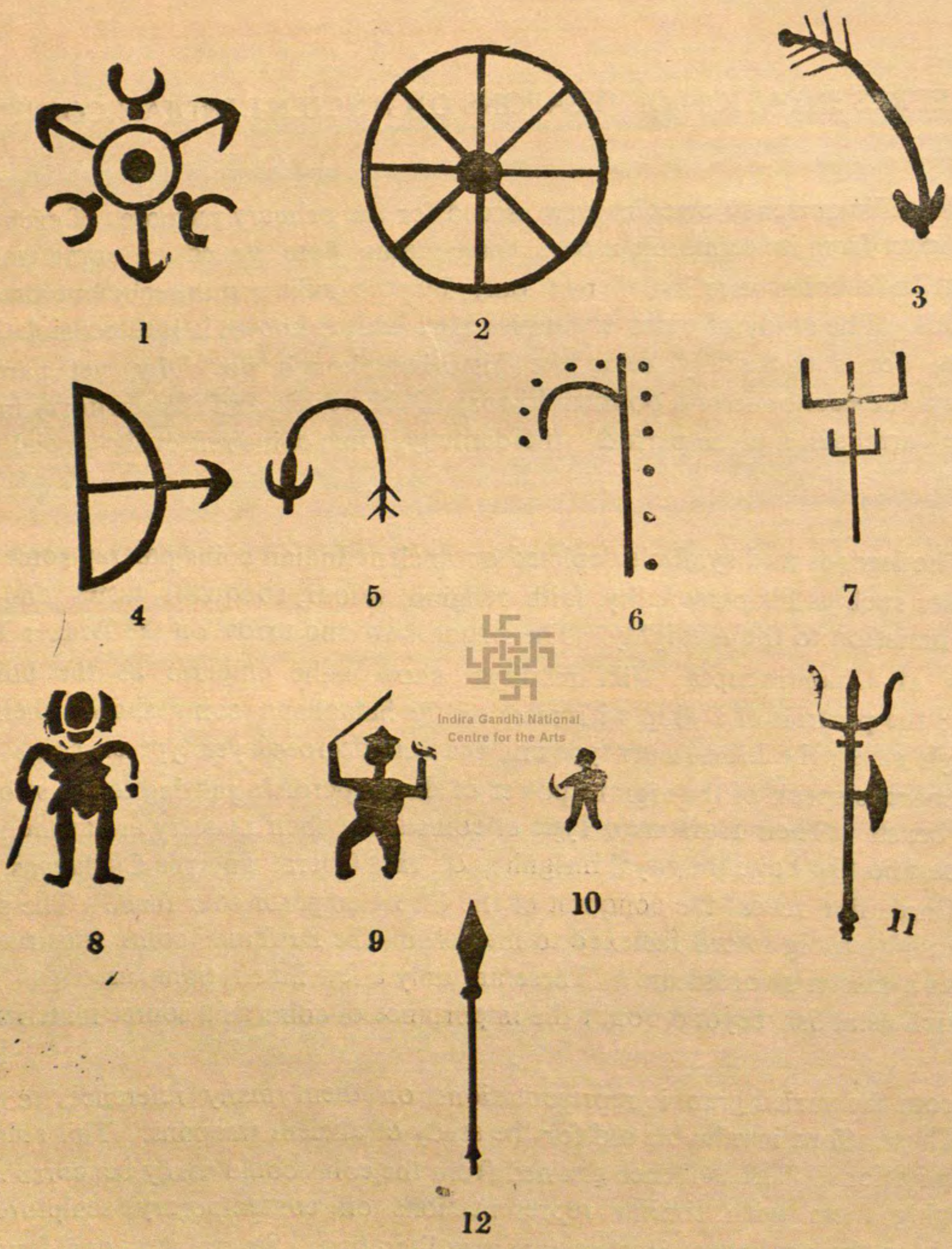
Metallic currency or coins were issued for the primary purpose of exchange or trade. Apart from its economic aspect some coins were issued as commemorative. In ancient India coins were issued not only by the ruling monarchs but also by the trade-guilds. The study of coins or numismatics as it is known is indispensible for the historians, for such a study helps the historian though not fully, yet partially to reconstruct the economic and political history of the people and the territorry in which they were current in a given period. Incidentally, some coins reflect the social life as well.

The legends and symbols depicted on ancient Indian coins portray some aspect of the ruler such as his personality, faith, religion, valour, conquests, tastes and above all his submission to the Almighty. The strung bow and arrow on the Archer Type of the coins of Chandragupta Vikramaditya show the emperor as the unrivalled bowman ; the portrait of a ship with mast on the Satvahana coins shows their might on the high seas ; the Lion-slayer type and the Rhinoceros-slayer type of coins of the Gupta monarchs speak of the vigrant power of the emperor in putting to the sword such powerful beasts. Their Horseman Type of coins show their mastery as cavaliers. The pair of fish and the bow, the royal insignias of the Cheras and the Chalukyas, shown with the Chola lion reveal the conquest of the Chola emperor over them. The portrait of Kaniska with a big sword fastened to his belt on the Kushana coins illustrates the emperor as a master swordsman. These are only a few illustrations amongst several others which establish beyond doubt the importance of coins as a source material.

From the varied graphic representations on them many references could be drawn. These afford invaluable aid for the study of ancient weapons. This study has its own limitations. The evidence gleaned from the coins could easily be corroborated by comparing them with similar representations on contemporary sculptures and paintings or to their reference in contemporary literature. Several weapons found on the coins of ancient India have been dealt with in this chapter.

---

*Originally this was written at the instance of the Late Dr. Vidya Prakash of Banaras Hindu University for the Journal of Numismatics Society of India. But unfortunately before this could be completed he left for his heavenly abode, The author is very much indebted to him for encouragement and many useful suggestions.



Weapons on Punch-marked and Tribal Coins

1. Arrows round a wheel.
2. *Chakra* (disc).
3. Arrow
4. Simple bow with arrow.
5. Curved arrow.
6. Elephant goad ?
7. Battle-axe ?
8. Kartikeya holding a spear
9. Figure carrying sword and shield.
10. Archer.
11. Trident with battle-axe.
12. Spear.

Bow, arrow and Quiver

The depiction of bow and arrow on coins predominates over other weapons. On punch-marked coins, figures of weapons and tools are exceedingly rare. The bow and arrow either with or without a taurine symbol are found on the obverse of two groups of coins.[1] The bow is of very simple type with curved stave and straight string. It is a common type found on early Andhra coins from Kolhapur.[2] Variant of 2, class II of the Taxila coins illustrated by Cunningham includes a wheel and a bow and arrow.[3] Indo-Bactrian aud Indo-Greek kings (4th-2nd Century B C.) preferred bow and arrow along with other weapons which figure very frequently on their coins. Two types of bows are generally noticeable, simple and complex. The simple bow was perhaps made of bamboo and the complex one of steel. On the Indo-Greek coins, Apollo is shown with the bow either resting on the ground or being held in one of his hands. The king on the coins of Artemidorous stands in a *Vikata* posture while on another coin he is seen in *Sampada* position. In the former posture the left leg of the king is advanced and bent from the knee and the right leg is straight while in the latter posture he is standing erect with both legs together.[4] The arrow-heads, both simple and feathered have been found. They are mostly pointed and barbed. Many specimens of those bows and arrows can be seen on the Indo-Greek coins preserved in the State Museum, Lucknow. The quivers of this period were round tapering at the bottom, broader at the top and open-mouthed. Bows enclosed in a case with pointed bottom and fairly broad top, can be notified on the coins of Zoilos in the British Museum collection.[5]

On the copper coins of Apollodotus, Apollo is seen standing facing left, holding the bow in his left hand and an arrow in the right.[6] Similarly, on the copper coins of Ziolus, Apollo is facing right holding an arrow with both hands and a quiver is slung from his back[7]. The coins of Maues also depict Apollo as an archer.[8] On the copper coins of Demetrius (*c.* 200 B C.), Artemis is shown standing with a bow in left hand and drawing an arrow from the quiver with his right hand[9]. Apollo as an archer again appears on the reverse of the silver coins of Eukratides (*c.* 175-156 B C.). Megasthenese and Arrian also corroborate that the bow and arrow were coveted weapons "The king hunts in the enclosures and shoots arrows from a platform in his chariot. At his side stand two or three armed women. If he hunts in an open ground he shoots from the back of an elephant."[10]

On the Andhra coins of Vasisthipura (*c.* A.D. 81), a crude bow strung and with a broad barbed arrow ready for use, has been depicted. An identical bow and arrow is seen on the coins of Gautamiputra of the same family. The coins of Bhumaka

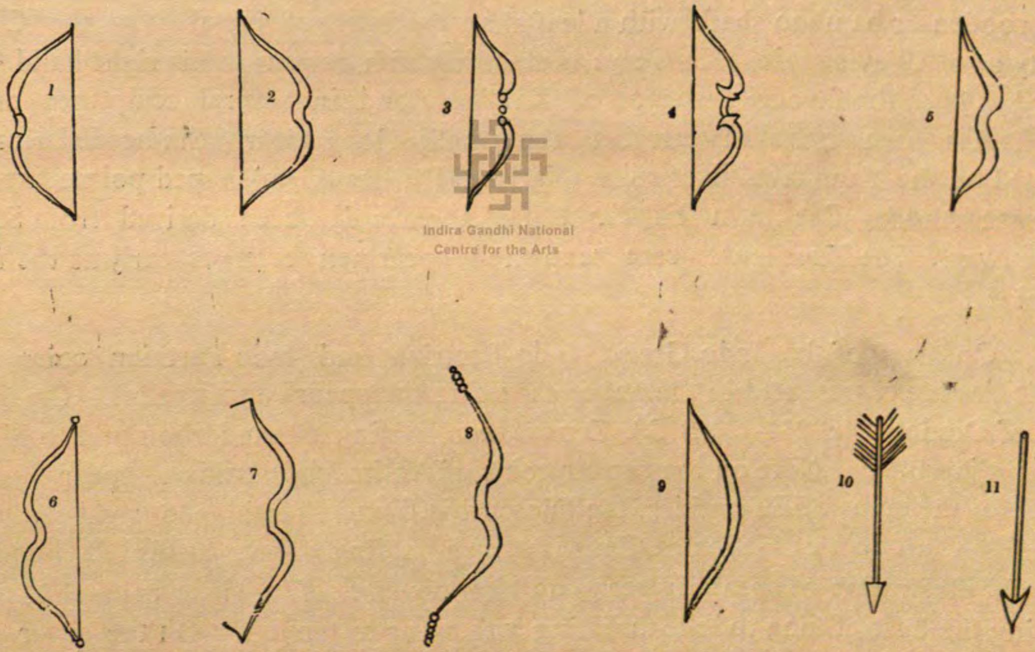
(A.D. 119) contain an arrow pointing upwards and a thunderbolt between a pallet.[11] On the lead coins of Mathariputra Sivalakur (*c.* 2nd Cent. A.D.) of Andhra dynasty discovered from Kolhapur, Maharashtra, is seen a bow with the string downwards and fitted with an arrow pointing upward.[12] On the reverse of the silver coins of Nahapana (*c.* A.D. 119-124) of the Kshaharata family a broad barbed arrow and on the obverse of still another coin a crudely outlined representation of a primitive semi-circular bow and arrow have been engraved.[13] Similar type represented in the Udaigiri caves corroborate the evidence of the coins. At Sanchi, the arrows are devoid of barbs.[14]

The bows on Gupta coins are of many types. One of a simple type consists of a curved stave and straight string.[15] In the second type two semi-circular pieces have been joined by a piece of wood or metal.[16] This joining piece is again of two types : straight[17] and curved.[18] On some grips, rings have been fixed to facilitate easy handling.[19] Specimens with curved grips having one guard on either side to avoid slipping are also available.[20] There is still another type where the grip recedes inwards thus making three curves in the bow.[21] In some other varieties of this type the ends of the stave are curved upwards so as to form five curves.[22] On a few specimens, the outer ends were segmented to fasten the string tightly and at the same time to beautify it.[23]

From the Gupta coins bearing the figures of bow and arrows the modes of shooting could be conjectured. The Gupta archer, as is clear from the postures of human figures using bow and arrow, usually stood firm on the ground in anyone of the following positions : with both legs together[24], with the legs wide apart[25], and with the right leg taut and the left bent[26] and *vice versa*[27] When not in use the top end of the stave was held either in the left or right hand while the other end rested on the ground with bow string facing either inward or outward.[28] While wielding it the bow was generally held in the left hand and the arrow in the right[29] but this position was found reversed on some coins[30] which might suggest the Gupta monarch could wield the bow with either hand.[31] Normally, while shooting an arrow, bow is to be held by the left hand. But the *Dhanurveda* mentions that wielding it with either hand is the quality of *Dhanurdhara.* Kalidasa has also mentioned that an expert archer could shoot the arrow with either hand with the same amount of accuracy.[32] Some Gupta kings are shown as holding the bow in the natural form, proving that they were ambidextrous.[33]

The bow was generally held vertically and almost parallel to the body and the string was pulled upto the ear.[34] The bow was neither held horizontal or perpendicular to the body nor was it kept on the ground while being used. Perhaps, by this time the old practice of the Mauryan archers had gone into disuse. The bow of the Mauryan archer was of the same length as the archer himself. "This they rest upon the ground and pressing against it with their left foot thus discharge the arrow having drawn the string far backwards for the shaft used is little short of being three yards long."[35] The Gupta bows were shorter than those of the Mauryans and were not operated with the foot.

The arrows had feathers at their lower ends.[36] The *Dhanurveda* has recommended the use of bird-feathers, especially of peacocks and herons for the swift movement. Kalidasa also mentioned this.[37] The heads were spear-shaped, barbed and had two cutting edges.



From Gupta Coins (after Vidya Prakash)
1—9 Bows 10—11 Arrows

The arrows were kept in quivers. The quivers found on the pre-Gupta coins have already been described above. In most cases the king has been portrayed facing front or in profile, hence the quiver which was hung on the back is not clearly visible In an Archer Type coin of Chandragupta II, the illustration of a quiver is very clear from which the king is drawing an arrow with his right hand.[38] The quiver is on the ground and several arrows are protruding from it. It is broad in the beginning, elongated and ends in a round knob. A similar quiver is to be found in the wall paintings of Cave No. 17 of Ajanta.[39]

Spears and Javelins

Spears and javelins were the most coveted weapons and have been shown on numerous coins. nO the obverse of the coins of Aryamitra, an Audambara Chief (*c.* 2nd 1st B.C.), a male figure is standing to left holding a spear in his right hand.[40] Similarly, the coins of Bhanumitra also depict a spear.[41] On one of the coins of Aryamitra of Ayodhya (*c.* 2nd cent. B.C), a bull is shown before a spear, while the coin of Jethamitra (*c.* 1st cent. B.C.-1st cent. A.D.), contains a spear along with tree in railing and *Chowrie*, on its reverse.[42] The spear, here, is very simple consisting of a long wooden or bamboo shaft with a leaf-shaped blade of metal. On the Class 2, variety a, of Ujjayini coins, Kartikeya is standing with a spear in his right hand.[43] The spear has been the favourite weapon of Kartikeya and in several sculptures of later date, he has been portrayed carrying abnormally long spear. Six-headed Kartikeya depicted on the Yaudheya silver coins (Variety III), has a leaf-shaped pointed spear in his right hand.[45] The term *Yaudheya* has apparently been derived from Sanskrit *Yudha* (war). The *Yaudheyas* were renowned spearmen even as early as the time of Panini.[46]

On many of the Indo-Greek, Indo-Bactrian and Indo-Parthian coins, kings and deities are represented in the act of thrusting the spears and javelins. On the gold coins of Diodotus (*c.* 244-230 B.C.), Zeus is seen hurling a thunderbolt and to his right is seen a javelin.[47] Nike on the copper coins of Antimachos holds a spear.[48] On the reverse of the coins of Eukratides, the Dioscuri is found charging to right with a long lance.[49] On a coin of Heliokles, Zeus is shown holding a spear in his left hand.[50] A beautiful illustration of spear is seen on the obverse of a silver coin of Menander showing the bust of king to left, thrusting with spear to the left. On the silver coin of Azes, the king riding on the horseback is with a couching spear.[52] A similar couched spear is depicted on a silver coin of Vonones.[53] A javelin with fillet is in the right hand of the king figured on the copper coins of Soter Megas.[54] On the silver coins of Demetrius (*c.* 200 B.C.), Pallas has it in his right hand while on the coins of Eukratides (*c.* 174-150 B.C.), Dioscuri is charging holding long lances.[55] The Indo-Greek and Indo-Bactrian monarchs preferred mounted warfare as they were excellent horsemen. Spears, lances and javelins were their preferred weapons against the short weapons like swords, daggers, etc.

In Sanskrit literature these are known as *Bhalla, Sula, Sakti,* etc. The difference between the spear and the javelin is so narrow and their depiction on coins so vague that one is mistaken for the other. Technically, *Bhalla* (spear) consists of a long wooden or bamboo shaft with a long and pointed iron blade. The blade is broader at the lower end, double-edged, with or without medial rib and with a long hollow shank into which the shaft is inserted. It is a thursting weapon. The *Sula* (javelin) is comparatively thinner having a wooden shaft and a small leaf-shaped blade of metal with a tang. The tang is inserted into the shaft and tied with metal straps. It could be used for dual purpose of thursting or hurling. The *Sakti* (*Barachha*) was completely of iron. Small thin iron shaft was fitted with a pointed blade which was invariably hurled.

Kanishka has been depicted as holding a spear on his coins.[56] On the reverse of another type of coins of the same monarch, a figure with a hat and plume is seen with a spear.[57] On the obverse and reverse of many coins of the successive rulers of this dynasty, the spears have been frequently represented. Huvishka has often been depicted carrying long spear. The Kushan spears and javelins did not undergo any material change and seem to have been adopted from their predecessors.

There has been a big controversy regarding the identification of spears and javelins on the Gupta coins. Smith has identified the so-called 'standard' on the 'Standard Type' coin of Samudragupta, as a spear.[56] In the left hand of Kartikeya, on the reverse of the 'Peacock Type' coin of Kumaragupta I, spear is illustrated. Vidya Prakash has classified these spears or javelins into the following five categories :

A. Spear with shaft slightly tapering towards the top and the spear-head representing a long-leaf with medial rib.[62]

B. Spear with shaft as above, with a ring near the lower end. The head has a pointed end with two corners on either side.[63]

C. Spear with leaf-shaped blade, medial rib, blunt point and a ring at the junction of the blade with the shaft.[64]

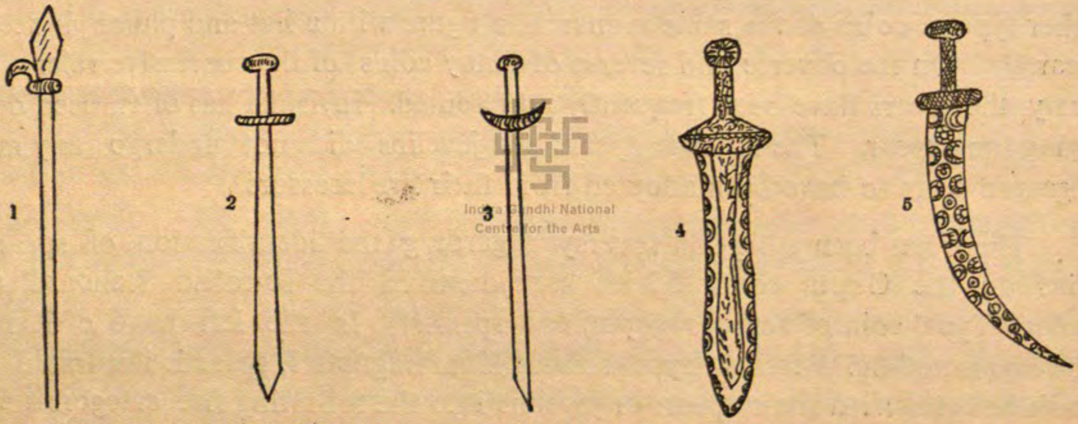
D. Spear with a broad leaf-shaped blade, narrowed in the middle medial rib and ring. Such spears are found in the hands of Kartikeya and on the Gupta sculptures.[65]

E. Spear with a point resembling an arrow-head and the lower extremes ending in a knob. This spear appears to be a heavy one and was perhaps thrown, as is evident from the knob on the other end intended to balance it in the flight.[66]

These spears and javelins were mostly held with points resting on ground. Some spears have pennons tied in the middle of the shaft.[67] Kalidasa has described the spear in the *Raghuvamsa*. Similar representations can be seen in the several contemporary sculptures[68] and paintings at Ajanta.

Sword

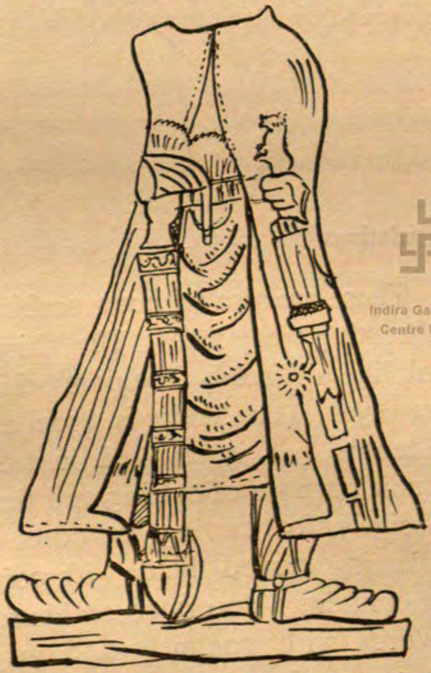
Surprisingly enough the sword, which has played a very prominent role in ancient Indian warfare, has been depicted very rarely on coins. On the punch marked coins it is not represented. Among the Tribal coins, discovered at Puri, we find crude figures of a king standing facing with head to left and holding a ṣceptre in his left hand[69]. This type is similar to the one found on the obverse of Kushan coins.[71] Very rarely on Indo-Greek, Indo-Bactrian and Indo-Parthian coins a sword is also seen. On the reverse of a silver coin of Heliokles, the last king of Bactria (*c.* 156-140 B.C.), however, Zeus is shown standing and holding a thunderbolt in his right hand and long sceptre in his left hand.[71] Similarly, on the coins of Antialkidas, the colleague and successor of Lysias, king of Punjab (*c.* 145 B.C.), Zeus is seen with a long sceptre in the left hand.[72] Of the several Indo-Greek coins preserved in the State Museum, Lucknow, not a single coin has a sword or a sceptre on them.



From Gupta Coins (after Vidya Prakash)
1. Spear 2—5. Swords

On the south Indian Pandyan coins, sceptre has often been depicted together with a trident, flag, dagger, etc.[73] Similarly, on the Vijayanagar coin a sceptre is represented.[74]

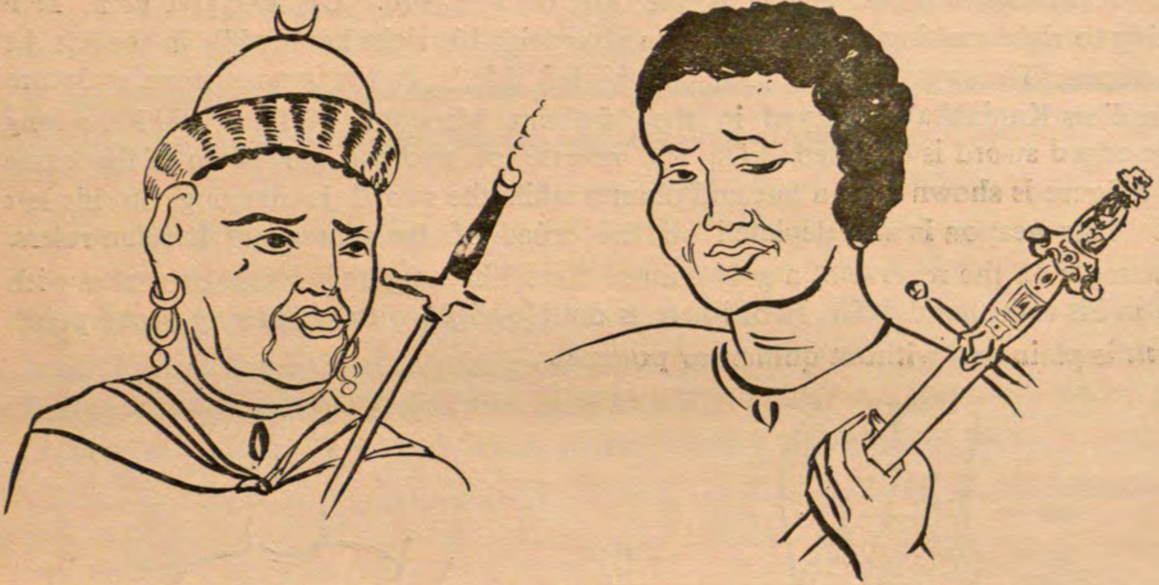
Kanishka was an adept in the use of a sword. On one gold coin, he is standing to right making an offering at an altar with his right hand while in the left he holds a spear. The sword is suspended from his left side.[75] In the famous stone sculpture of 'Headless Kanishka' displayed in the Mathura Museum, Mathura (U.P.), a long double-edged sword is depicted. On the reverse of another gold coin of the same ruler, a figure is shown with a hat and plumes while the sword is hanging on his left side[76]. This weapon is also depicted on the coins of the subsequent Kushan rulers. For example on the reverse of a gold coin of Huvishka, a figure is seated on snakes with sword in his right hand.[77] The sword here is double-edged with sufficiently broad point. The hilt is plain and without quillon or pommel.



'Kanishka' holding a Sword

Warrior holding a Sword
(from Ajanta paintings)

The Gupta coins have several types of swords figured on them. The 'Horseman Type', the 'Chhatra Type', the 'Chakravikram Type' and the 'Rhinoceros-slayer Type' contain several illustrations of this weapon. On the same analogy one type of coin has been designated as the 'Swordsman Type'. In the first variety, is found a long and straight blade with triangular-shaped pointed end. The pommel is short, round and simple, the quillon is rectangular with lines on it and the blade is plain. It is without a scabbard and in all probability was used as a thrusting weapon.[78] In the second variety, the swords are straight with plain and pointed blades. The lower end has a cut on its right. The quillon is crescent-shaped which served the purpose of a



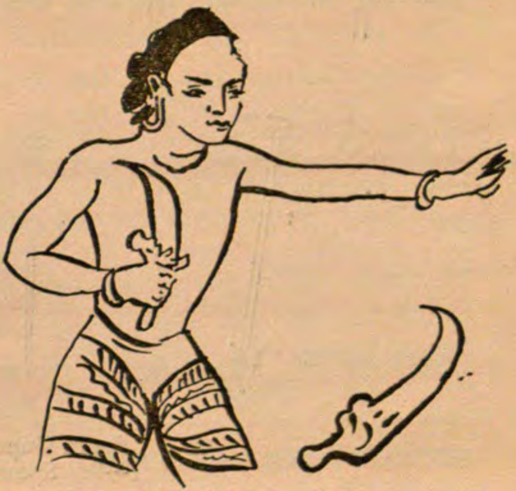
Swords from Ajanta paintings

grip as well. The pommel is short and round. These are also without scabbards and like earlier swords were also found suitable as thrusting weapons.[79] The third variety of swords are double-edged and straight and look like a *Khanda*. The pommel is round, grip plain but the quillon is shaped like a human eye. The blade is broader at the upper and the lower ends but thinner in the centre. It is encased in a decorated scabbard. These types of swords served the double purpose of cutting and thrusting.[80] The swords of the fourth variety were used exclusively for cutting purposes. Round pommel, plain grip, rectangular quillon and sharply curved blade with pointed end bring it closer to the *Shamsher* of later date.[81] It contains a decorated scabbard as well. We also find some short and double-edged swords with pommels and grips. The 'fuller' runs through them. Their blunt points suggest that these were perhaps cutting weapons.

These swords were kept in the decorated scabbards and hung either on the left or the right side of the warrior from a belt.[82] The Allahabad Pillar Inscription gives a long list of the weapons, which inflicted wounds on Samudragupta's body, and the sword is one of them.[83] Kumaragupta, in an inscription on one of his coins, describes himself as a master of swordsman.[84] The sculptures of Deogarh (Pl. XXXI), the paintings of Ajanta (Pl. LVII), and the works of Kalidasa bear testimony to the general types of swords illustrated on these Gupta coins.

Dagger

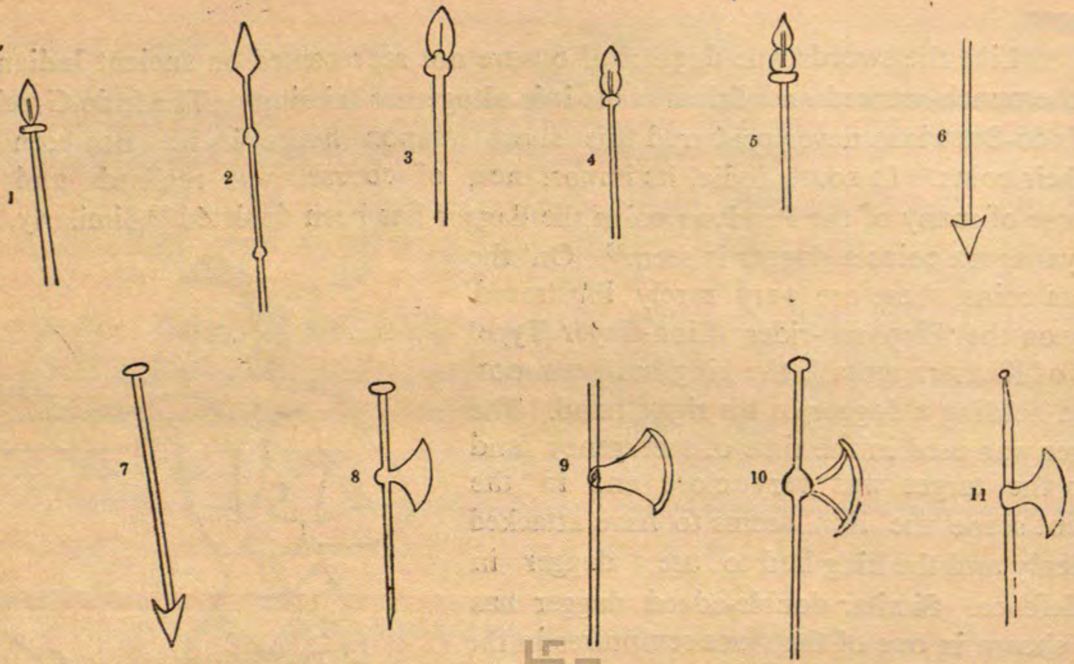
Like the swords, the daggers also were not represented on ancient Indian coins. On the punch-marked and Tribal coins it is altogether missing. The Indo-Greeks and the Indo-Bactrians never preferred this short weapon hence it has not been shown on their coins. In south India, its importance, of course, was realised. and on the obverse of many of the Pandyan coins the dagger has been depicted.[85] Similarly, on the Vijayanagara coins a dagger is seen.[86] On the Gupta coins, these are very rarely illustrated. Only on the 'Elephant-rider Lion-slayer Type' coin of Kumaragupta I, the king has been porrayed holding a dagger in his right hand. The dagger was used in the time of emergency and when the target was very close and in the present scene the lion seems to have attacked suddenly and the king had to use a dagger in self-defence. Similar double-edged dagger has been shown in one of the stone sculptures in the collection of the National Museum, New Delhi, showing a warrior mounted on a leogryph and the dagger is seen suspended from his waist.[87]



Daggers from Ajanta paintings

Battle-axe

The battle-axe consists of a short wooden shaft with a crescent-shaped blade attached to it on the side near the top end. On the Audumbara coins, the battle-axe is attached with the trident of Siva.[88] On one anonymous coin of *circa* 2nd century A.D., Siva is standing facing left holding a trident with axe on the shaft in his right hand.[89] Similar tridents with axe have been found on the reverse of the silver coins of Dharghosha and Vimaki.[90] It is again shown on the copper coins of Jayadaman, son of Chastana (*c.* A.D. 121-150).[91] Samudragupta, in his 'Battle-axe Type' coin holds a battle-axe in his left hand. The shaft is of the same height as the king. The hemispherical blade is attached to the middle of the shaft. Two knobs, one at the either extreme end of the shaft, are visible.[92] The shape of the blade differs in several other coins of the same variety. The circular legend on the obverse of this type describes that "Wielding the battle-axe of Krishna, unconquered conqueror of (till then) unconquered kings, is victorious." The inscription reveals that it was a deadly weapon and could create havoc when used in war, but this weapon gradually fell into disuse and ultimately became outdated. This and a few more types of battle-axes can be seen in the wall-paintings of Ajanta.



From Gupta Coins (after Vidya Prakash)
1—7. Spears, etc. 8—11. Battle-axes

Mace

Mace was an important weapon used in the Mahabharata war. According to Kautilya it could also be hurled at the enemy but usually it was used as a weapon for smashing. Though not very popular, yet it has been depicted on many a coin. On the reverse of Rajuvala, Class III, variety a, of coins (*c.* 40-20 B.C.)[93], Hercules is standing to left with right hand out and club or mace in his arm. A club or mace over the shoulder has been shown on the obverse of a square copper coin of Lysias[94]. Knotted club can be seen on the reverse of the square copper coins of Menander.[95] On the copper coin variety 12, of Hermalus, a club is found resting on the ground.[96] Hercules, with club on his left shoulder, has been portrayed on the coins of Spalahores and Vononos on the obverse,[97] while on the copper coins of Kadaphises I, this weapon is in his right hand.[98] A knotted club has been depicted on the gold coins of Kadaphises II also. Club was the favourite weapon of Heracles It appears on the Indo Greek coins, as a tapering rod, heavy at the bottom and attached with spiked knots. It is usually held by its top and the lower mace-end is seen resting on the ground.[99] On a few coins it appears resting over the arms of the deity with top shaft end downwards.[100] On other coins it figures independently.

The mace has been depicted on the 'Chakravikrama Type' of coins of Chandragupta II. Here, it has been shown as an attribute in the left hand of *Chakrapurusha* i. e. the personification of *Sudarshana Chakra* of Vishnu.[101] The mace is simple, consisting of a short rod or shaft, mounted with thick globular knob at the end, Though the club has been often depicted on the sculptures and paintings of later date its utility as a weapon of war was gradually diminishing and with the advent of the Arabs its use in the battlefield had almost become extinct.

Trident

It was essentially a weapon not of war but one which could be used in times of exigency, but owing to its association with Saivism, it has often been shown on the ancient Indian coins. Trident with axe has already been referred to above. It was commonly known as '*trisula*' (three pronged blade). The countermark trident is seen on the obverse of the coins of Brihaspatimitra II (*c.* 2nd cent. B.C.) of Kausambi[102] Similarly, on the obverse of the coins of Dhanadeva and Agnimitra (1st cent. B.C.) the trident is visible.[103] Siva with trident is found on the silver coins Class III, variety a, of *Yaudheya* coins.[104] On Pandyan coins it is seen along with other weapons[105] and also on the obverse of Chola coins along with bow.[106]

It consists of a long staff with a three-pronged blade at the top. The shape of the shaft varied on Indo-Greek coins. In some, like those on the coins of Demetrius,[107] are straight and plain and in others the side-prongs are curved while the central one is leaf-shaped, as in the case of the coins of Antimachus.[108]

Since the Gupta monarchs were Vaishnavites the trident does not appear on their coins but illustrations can be seen in contemporary sculptures.

Goad

Strictly it was not a weapon of war but has been very closely associated with elephant-corps as a useful aid to goad the elephant. It was called *Ankusha* (i.e. to control). It consists of a short shaft with a leaf-shaped pointed blade on one side and a curved prong on the other, both of metal. On the reverse of the coins of Gomitra II (*c.* 200 B.C.) of Mathura, three elephant-goads have been depicted.[109] Similar illustrations have been found on the coins of Brahmamitra, Suryamitra, Vishnumitra, Purushdatta, Balabhuti and Ramadatta of the same dynasty.[110] Fine examples of the elephant-goads of this period can be seen on the Sunga sculptures in the National Museum, New Delhi.

The goad has also been depicted on the 'Elephant-rider Type' coins of Kumaragupta I. The king himself is driving the elephant with the goad in his right hand.[111] The goad resembles the modern one. The elephant-goad has not undergone any significant change during these hundreds of years. In later varieties it has been profusely decorated ; ivory was also used for its staff.

Thunderbolt

It is a mythical weapon and usually associated with Indra. On the coins of Rajuvala (*c.* 40-20 B.C.), Class I, Variety a, Pallas is seen standing left, holding in left hand *Aegis* and hurling thunderbolt with his right.[112] It was the favourite weapon of Zeus and Pallas. Zeus, standing to left and hurling thunderbolt, is seen on the gold coins of Diodotus (*c.* 245-230 B.C.).[113] Two varieties, simple and winged, of thunderbolt, also called '*vajra*' are noticed. The first again presents two sub-types one with straight-prong and the other with curved-prong. Winged-thunderbolt is depicted on the reverse of the copper coins of Demetrius II (*c.* 200 B.C.).[114] Thunderbolt along with shield is seen on the reverse of the silver coins of Menander.[115] On the coins of Bhumaka (A.D 119) and Nahpana of the Ksaharata family thunderbolt is found.[116]

The weapon was held by the middle but sometimes it rested over the shoulder as well. During use it was hurled either by raising it above the shoulder or just above the waist

Chakra (Disc)

It is represented only on the coins of Menander[117] where it resembles a spoked wheel the ends of which are slightly protruding. These were pointed spokes. It is mythical and was one of the attributes of Vishnu.

Noose

The noose or *pasa* has been shown only in the hands of deities as their attributes and was never used in actual warfare. The coins depict it as a long rope with a knotted end and a large loop in the middle.[118] On some coins the loop is at one end [119] *Pasa* was made of hemp, flax, '*munju*' grass, '*bhanga*' (*crotatarea Juneca*) or '*Snayu*', etc. and was ten cubits long. The loop on one end was one cubit in diameter.

Helmet

Ancient Indian warriors knew well how to protect themselves and Kautilya gives a complete list of armours for protection from head to foot. Indo-Greek kings have been portrayed as helmeted warriors on their coins. On the obverse of silver coin of Sophytes (*c.* 305 B.C.) helmeted head of the king to right is seen.[120] The helmet is adorned with a wreath of leaves on it. There is also a check-piece and a plume attached. On the slope of the neck are the letters MN. The helmet of the king on the obverse of silver coin of Eukratides has an ear and horn of bull and a plume.[121] Flat helmet is seen on the obverse of a silver coin of Antialkidas.[122] On the obverse of the square copper coins of Agathokleia and Strato a queen has been shown wearing a helmet.[123] Helmeted head of Athene with long curls on the obverse of silver coins of Menander can be seen.[124]

Helmets are not depicted on Gupta coins ; perhaps the Gupta monarchs never used them.

Shield

Shield was used for defence. On the Indo-Greek coins it appears usually in the hands of goddess Pallas and sometimes with Zeus. Pallas holding shield is seen on the reverse of the coin of Menander[125] and Zeus with shield on the coins of Agathocles. It is mostly round but on variety 14 of Menander's coin the shield is not round but has a peculiar shape with Medussa's head. The shield was made either of leather or metal. Often these have beautiful devices in the centre. It is seen over the left arm or hung from behind. In a few cases it has been figured independently.

Shield appears on the 'Apratigha Type' of Kumaragupta I, in the left hand of the male figure standing on the extreme left in the group.[126] The shape is not clear but it appears to be rectangular and held vertically.

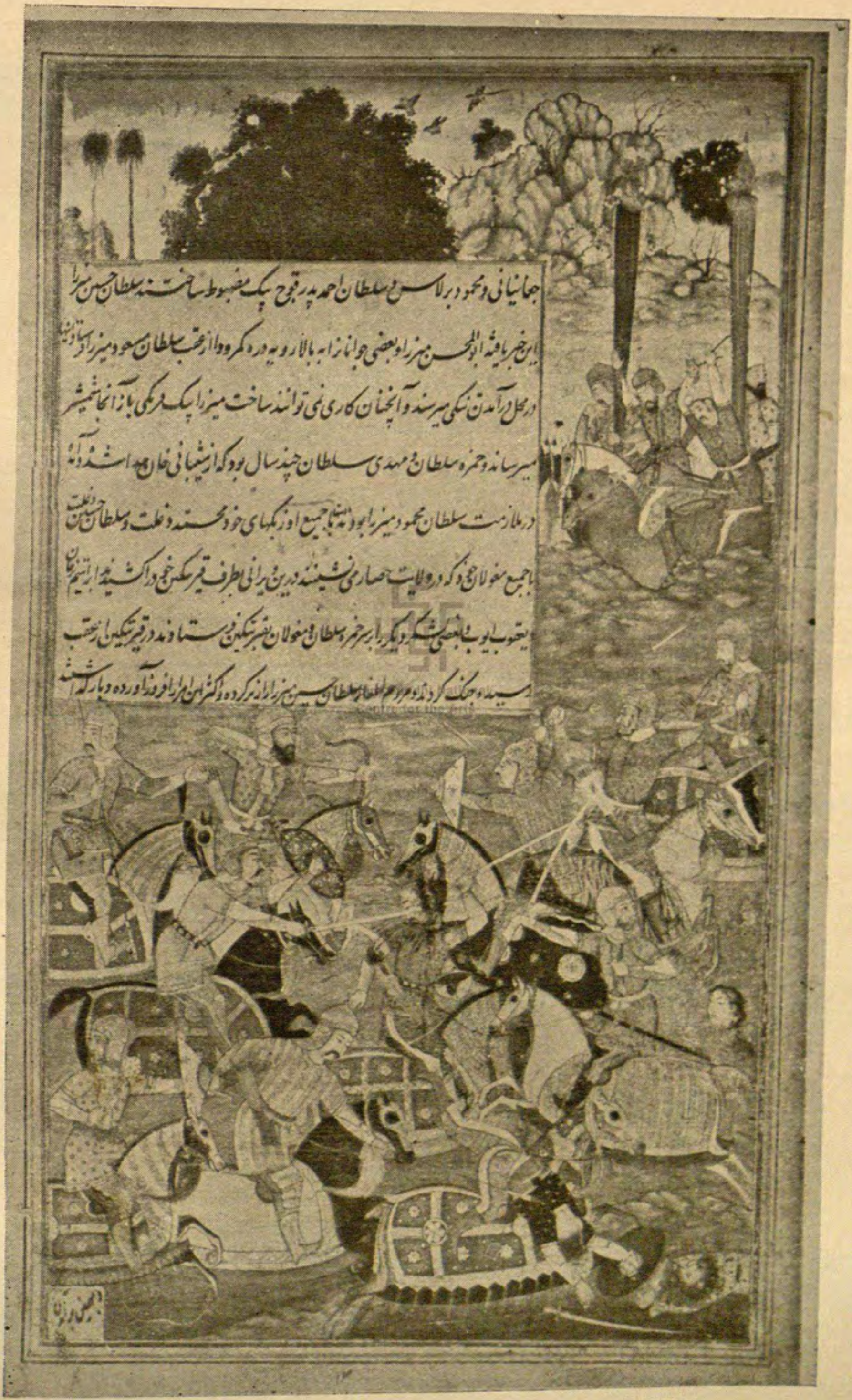
References

1. John Allan : *A Catalogue of the Indian Coins in the British Museum* (1936), p. XXXII.
2. E.J. Rapson : *C.A.W.K*, pp. 5-9, Pls. I-IV.
3. A. Cunningham : *Coins of Ancient India* (London, 1891), III. p. 14.
4. Lahiri : Pl. X, 8.
5. *British Museum Catalogue* : Pl. XXXII, 2.
6. J. Rodgers : *Catalogue of the Coins in the Government Museum, Lahore* (1881, Calcutta), p. 5.
7. *Ibid.*, p. 8.
8. *Ibid.*, p. 10.
9. V.A. Smith : *Catalogue of the Coins in the Indian Museum, Calcutta*, Vol. I. (Oxford, 1906.) Pl. I, 10, p. 9.
10. J.W. Mc Crindle : *Ancient India as described by Megasthenese and Arrian* (1960, Calcutta), p. 71.
11. E.J. Rapson : *A Catalogue of the Indian Coins in the British Museum* (1901, London), Pl. IX, No. 237, p. 63.
12. *Ibid.*, No. 2, Pl. IX p. 7.
13. *Ibid.*, No. 243, p. 67.
14. Sir John Marshall : *A Guide to Sanchi.*
15. *B.M.C.G.D.* : Pl. VI, 10, *J.N.S.I.*, V, Pl. IX, B, 11.

16. *B.M.C.C.D.* : Pl. VI, 6, 4, 7. 16, XII, 1-2, 6 and *BHC*, Pls. VI, 2, VII, 12-14.
17. *B.H.C.* : Pls. V, 15, VI, 1, VII, 7-8.
18. *B.M.C.G.D.* : Pl. VI, 13 ; *BHC* Pl. XI, 12 and *JUPHS*, V, pt. II, Pl. IV, B. 1.
19. *B.H.C.* : Pls. X, 10, XXI, 5, XXXIII, 5, 6.
20. *B.M.C.G.D.* : Pl. XXII, 7, 9 ; *BHC*. Pl. X, 10.
21. *B.H.C.* : Pls. VIII, 6-8, X, 6-8.
22. Vidya Prakash : *J.N.S.I.*, (Golden Jubilee Volume 1961). Pl. XXIII,
23. *B.M.C.G.D.* : Pl. IX, 9.
24. V.A. Smith. : *op. cit.*, (1905), Fig. 16.
25. *Ibid.*, Pl. XV, Fig. 14.
26. *Ibid.*, Pl. XV, Fig. 17.
27. *Ibid.*, Pl. XVI, Fig. 4.
28. *B.H.C.* : Pl. IX, 2.
29. M.N. Dutta : *Agnipurana*, Vol. II, p. 896.
30. *B.M.C.G.D.* : Pl. II, 145 and VIII, 13, *BHC*. Pl. XVI, 8-13.
31. Vidya Prakash : *op. cit.*, (1961), p. 285.
32. B.S. Upadhyaya : *India in Kalidasa*, p. 165.
33. *B.H.C.* : Pl. LXXXVI.
34. Kalidasa : *Raghuvamsa*, VII, 57.
35. Mc Crindle : *op. cit.*, p. 16.
36. Kalidasa : *Op. cit.*, V. 55.
37. Kalidasa : *Shakuntala*, 1, 11.
38. *Num. Chron.* : (1910), Pl. XIV, 2 ; *IMC*. No. 48, p. 13, *RMCGD*. Pl. VI, 13, *J.N.S.I.* XIX, pt. II, p. 11, 5.
39. Yazdani : *Ajanta*, Cave No. XVII.
40. John Allan : *C.I.B.M.* p. 125.
41. *Ibid.*, p. 128.
42. *Ibid.*, p. 137.
43. *Ibid.*, p. 156.
44. *Ibid.*, p. 245.
45. A. Cunningham : *C.A.I.* (London, 1891), p. 56.
46. *Ibid.*, p. 56.
47. C.J. Rodgers : *op. cit.*, (1891).
48. *Ibid.*, p. 2.
49. *Ibid.*, p. 3.
50. *Ibid.*, p. 3.
51. *Ibid.*, p. 6, var. 13.
52. *Ibid.*, p. 10.
53. *Ibid.*, p. 13.
54. *Ibid.*, p. 16.
55. V.A. Smith : *op. cit.*, Pl. I, 10, p. 9.
56. J. Rodgers : *op. cit.*, p. 18.
57. *Ibid.*, p. 18.

58. *Ibid.*, p. 18.
59. V.A. Smith : *J.R.A.S.* (1889), p. 68.
60. *BHC*, Pl. XXVI, 1-13 ; *JASB* (1884), Pl. IV, 1-2 ; *J.R.A.S.* (1889), Pl. III, 1-2. *J.N.S.I.* XI, Pl. 1, 13.
61. Vidya Prakash : *op. cit.*, p. 288.
62. *Ibid.*, p. 288 and *BMCGD*, p. 1.
63. *Ibid.*, p. 288 and *J.A.S.B.* (1884), Pl. II, 3.
64. *Ibid.*, p. 281 and *B.H.C.*, Pl. XXVI, 5.
65. *Ibid*, p. 288 ; *B.H.C.*, Pl. XXVI, 7, 12, *B.M.C.G.D.*, Pl. XV, 14 ; K.M. Munshi : *The Saga of Indian Sculptures*, Pl. XXXXII.
66. *Ibid*, p. 288 and *B.H.C.*, Pl. III, 11, 13.
67. *Ibid.*, p. 288 ; *B.H.C.*, Pl. XXVI, 1; *J.N.S.I.* XI, Pl. I, 13 and *B.M.C.G.D.*, Pl. XV, 5, 8.
68. K.M. Munshi : *The Saga of Indian Sculptures*, Pl. XXXXII.
69. John Allan : *op. cit.*, Var. a, p. 205.
70. *B.M.C.* : Pl. XXVIII, 2.
71. J. Rodgers : *op. cit.* (1891), p. 3.
72. *Ibid.*, p. 3.
73. T. Desikachari : *South Indian coins* (1933).
74. *Ibid.*
75. J. Rodgers : *op. cit.*, p. 18.
76. *Ibid.*, p. 18.
77. *Ibid.*, p. 20.
78. *B.M.C.G.D.* :Pl . VIII, 1, 4-5 and *B.H.C.*, Pl. XV, 4,6,8.
79. *B.H.C.* : Pl. XXV, 11-15.
80. *B.M.G.C.D.* : Pl. VIII, 8.
81. *B.M.C.G.D.* : Pl. XIII, 16-19 and *BHC*, Pl. XXIV, 2, 4, 7.
82. *B.M.C.G.D.* : Pl. IX, 15-17 ; *BHC*, Pl. XIII, 13-15 and *J.N.S.I.*, XI, Pl. III, 8.
83. Fleet : *Corpus Inscription Indicarum*, Vol. III, (1963.)
84. V.A. Smith : *op. cit.*, Pl. III. No. 1.
85. T. Desikachari : *op. cit.*
86. *Ibid.*
87. Gupta Gallery : National Museum, Janpath, New Delhi.
88. John Allan : *op. cit.*, p. 123.
89. *Ibid.*, p. 167.
90. J. Rodgers : *op. cit.*, p. 16.
91. E.J. Rapson : *A Catalogue of the Indian coins in the British Museum* (London, 1908) No. 265.
92. *B.M.C.G.D.* : Pl. IV, 8-16 ; *B.H.C.*, Pl. V, 6-14 and *J.N.S.I.* (Poddar collection) XIV. Pl. VI, 11.
93. John Allan : *op. cit.*, p. 187.
94. C.J. Rodgers ; *op. cit.*, p. 4.

95. *Ibid.*, p. 7.
96. *Ibid*, p. 9.
97. *Ibid.*, p. 13.
98. *Ibid.*, p. 17.
99. Lahiri : Pl. II, I (Coins of Eythedemos *P.M.G*, Pl. I, 8 ; Agathocles Pl. II, 1 ; Antimaches, Pl. VI, 2)
100. *P.M.G.* : Pl. I, 18, (Coins of Demetrious, Zoilos and Euthydemos).
101. *B.H.C.* : Pl. XVIII, 14 and *J.N.S.I.* : XII, Pl. VII, 8.
102. John Allan : *op. cit.*, p. 152.
103. *Ibid.*, pp. 153-4.
104. *Ibid.*, pp. 270-6.
105. T. Desikachari : *op. cit.*
106. *Ibid.*, No. 97.
107. Lahiri : *op. cit.*, Pl. XII, 7.
108. *B.M.C.* : Pl. V, 1.
109. John Allan : *op. cit.*, p. 170.
110. John Allan. : *op. cit.*, pp. 173 4.
111. *B.H.C.* : Pl. XXXI, 1-3, *Brihatsamhita*, 72.4 and Vidya Prakash, *JNSI* (1961), p. 291.
112. John Allan : *op. cit.*, p. 187.
113. C.J. Rodgers : *op. cit.*, p. 7.
114. *Ibid.*, p. 2.
115. *Ibid.*, p. 13.
116. E.J. Rapson : *op. cit.*, Nos. 237-8, 243, 252, pp. 63-67.
117. Lahiri : *op. cit.*, Pl. XXIV, 7.
118. *B.M.C.G.D.*, Pl. IV, 1. V, 2. VI, 16 : Vidya Prakash, *op. cit.*, p. 291.
119. Num. Chron : (1910), Pl. XIV, 5 ; *B.M.C.G.D.*, Pl. 7 and Vidya Prakash, *op. cit.*, p. 291.
120. C.J. Rodgers : *op. cit.*, p. 1, no. 1 and Smith, *op. cit.*, Pl. I, p. 7.
121. *Ibid.*, p.3.
122. *Ibid.*, p. 3.
123. *Ibid.*, p. 5.
124. *Ibid.*, p. 6.
125. *Ibid.*, p. 13.
126. *B.H.C.*, Pl. XXXI, 6-13 ; *J N.S.I.*, XII, Pl. VII, 1-4, Vidya Prakash, *op. cit.*, p. 292.



A BATTLE SCENE,
MUGHAL, LATE 16th Cent. A.D.

WEAPONS DEPICTED IN INDIAN PAINTINGS

Indian paintings present a picturesque view of contemporary life. Men, women, birds, animals and trees have been painted with animated grace. It is an art of sensuous refinement in which the charms of courtly living and the liveliness of the common people are portrayed lucidly. From the paintings it is possible to reconstruct the social, economic and political conditions of the period. Thus, from the paintings portraying hunt, warfare, etc., we get an idea of the weapons in use, technique, strategy, etc.

Paintings assignable to the pre-historic period in India are scanty. There are primitive records of hunting and fighting-scenes crudely drawn on the walls of caves in the Kaimur Range, Central India. Examples of later Stone Age are found in the Vindhya hills. A hunting scene, depicted graphically, has been located in the caves in Raigarh where a number of people are trying to secure a huge bison. The Stone Age, as evidenced in the rock paintings of Mirzapur caves is an isolated example. The earliest datable paintings are in Jogimara caves, which depict the long spears, bows and arrows. In the scene, the arrow has pierced right through the animal's body.

The Ajanta paintings represent maturity in art form. The weapons depicted here are of a common and simple variety. We find curved daggers, scimitars with and without scabbard, and shields, etc. There are also quivers for holding arrows. In one of the paintings are seen long lances with diamond shaped blades and streamers from the spears flying in the air. In another cave a curious spear, 8 feet long and with three rings at the top is painted.

Of the two dozen different types of weapons, sword alone has been painted not less than fifty times. In Cave No.1, a painting shows two soldiers armed with short swords and shields. In Cave No 2, a lady is seen kneeling before a king who is brandishing a naked sword. A painting in Cave No. 17, depicts the Raja of Banaras being escorted by armed soldiers. In it could also be seen a sleeping king whose sword along with the belt is by his side. A series of paintings depict the flight of a whole army of elephant-riders, horsemen and infantry which was routed by king Saudas.

In the scene 'Vijaya's conquest of Ceylon' (Pl. LVII) many types of weapons viz., *Chakra*, lance, chopper, shields, both crescent-shaped and oblong, sword, classical double-curved variety of bow, quivers – square and round and pot-shaped and skull-cap helmet have been painted.

Ajanta frescoes mostly record *Jataka* stories but some of them are largely secular in their themes and represent affairs of the kings and court life of the times. Cave No.17 contains the painting of *Sarabha Jataka* where the king is seen riding on a spirited horse. Quivers filled with arrows are attached to the horses' saddle of the king and that of his retinue.

Representation of ships and boats in the wall-paintings are mostly found in Cave No.2 (522-650 A.D.). One such vessel is a sea-going ship with a high stem and stern. The other type is a crocodile-headed large vessel. A few of them are loaded with infantry, cavalry and elephants and under the command of Vijay are ready for the landing in Ceylon (Pl. LVII).

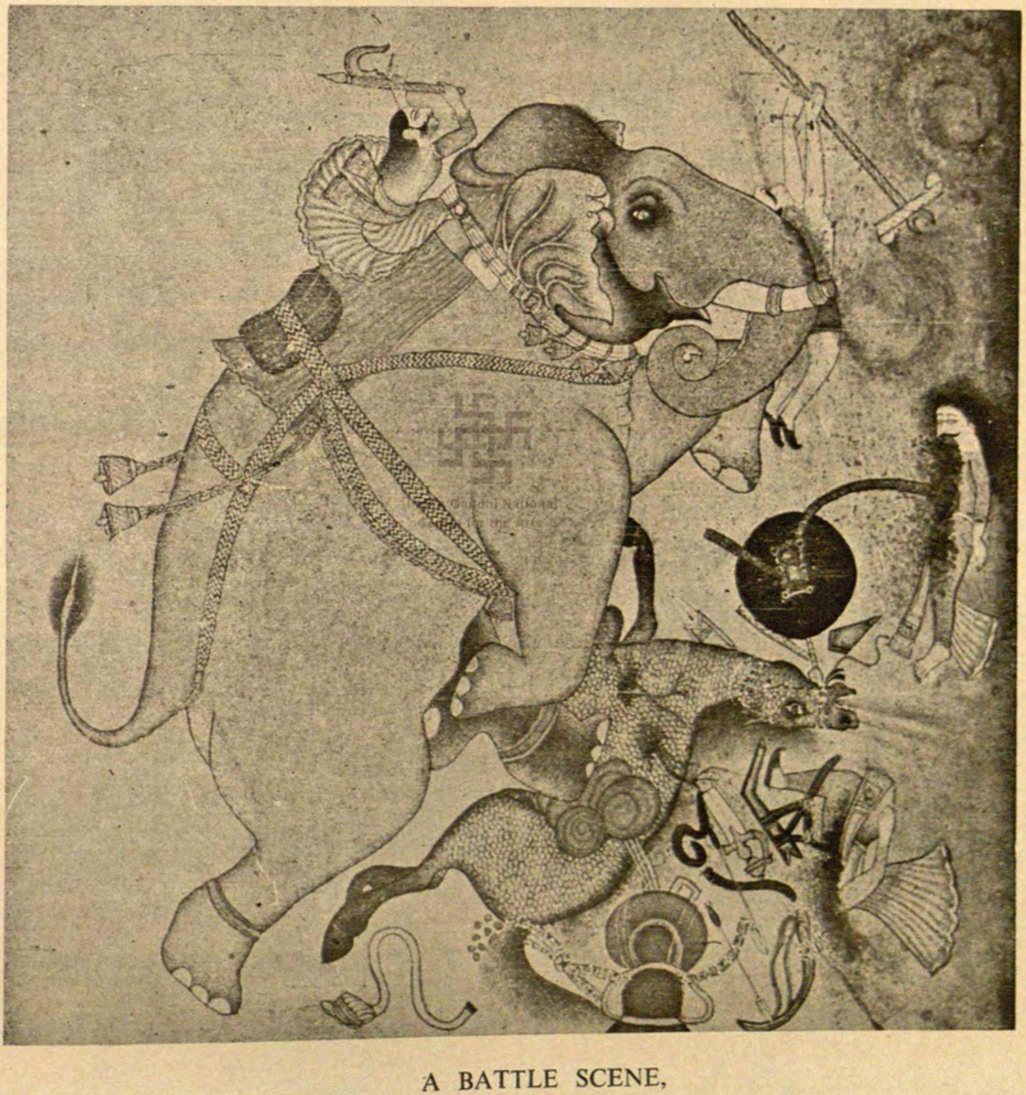
In the wall-paintings at Bagh arms are also depicted. Here we find a bow painted in blue.

Besides wall-paintings we have a few painted manuscripts of palm leaves and paper, which are in the typical Western Indian style of 12th to 14th centuries. A few painted manuscripts of Pala School (10th to 12th century A.D.) are also available.

In one of the miniature paintings from the *Jaina Kalpasutra* we find Trisala relating her dreams to Siddhartha, who explains their significance and assures her that the dream presaged the birth of a son. The king is seated on a throne and holds in his right hand a double-edged sword without a scabbard. In most of these paintings Siddhartha has been depicted holding this typical sword. The axe can be seen in figure 94 while discus and mace in figure 110 of the same manuscript.

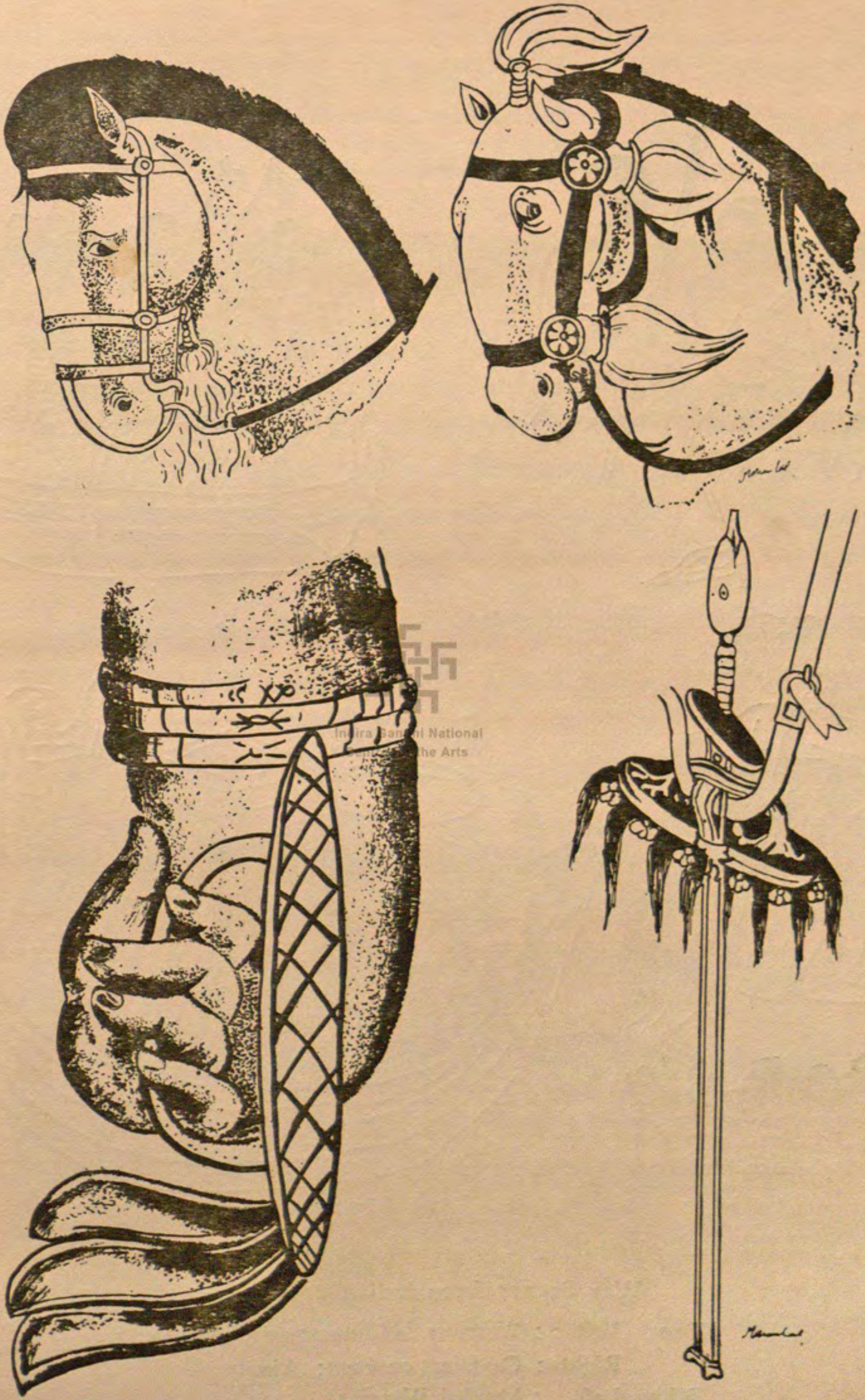
Babar was a soldier-scholar. As a writer and poet he possessed fastidious and critical tastes. He has bequeathed a delightful record of his activities in his memoirs, popularly known as *Babar-Nama*. Illustrated copies of *Babar-Nama* are in the British Museum and the Victoria and Albert Museum, London, the Louvre Museum, Paris and the Hermitage Museum Leningrad. The fifth copy is in the National Museum, New Delhi. It has 183 paintings (Pl XIV) and contains the names of 48 painters It was illustrated in the 42nd year of Akbar. In one painting, the scene of the Battle of Panipat (A.D. 1526) is very interesting. Here Babar protects his vanguard by rows of 700 moveable carts which were tied together by ropes of hides. Small

Plate XV



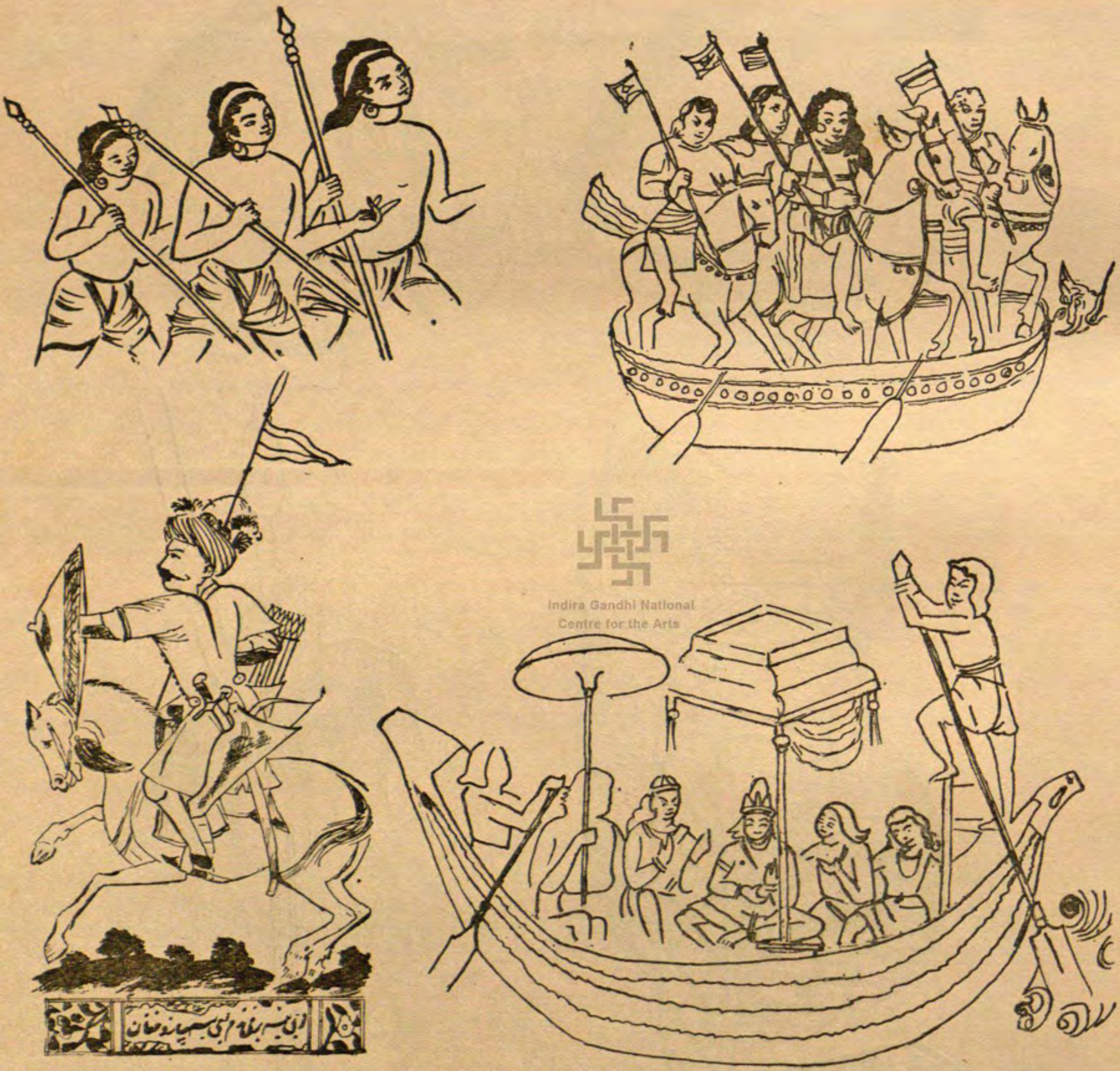
A BATTLE SCENE,
MUGHAL, EARLY 16th Cent. A. D.

(*Collection* : *National Museum, New Delhi.*)



Weapons from Ajanta Paintings

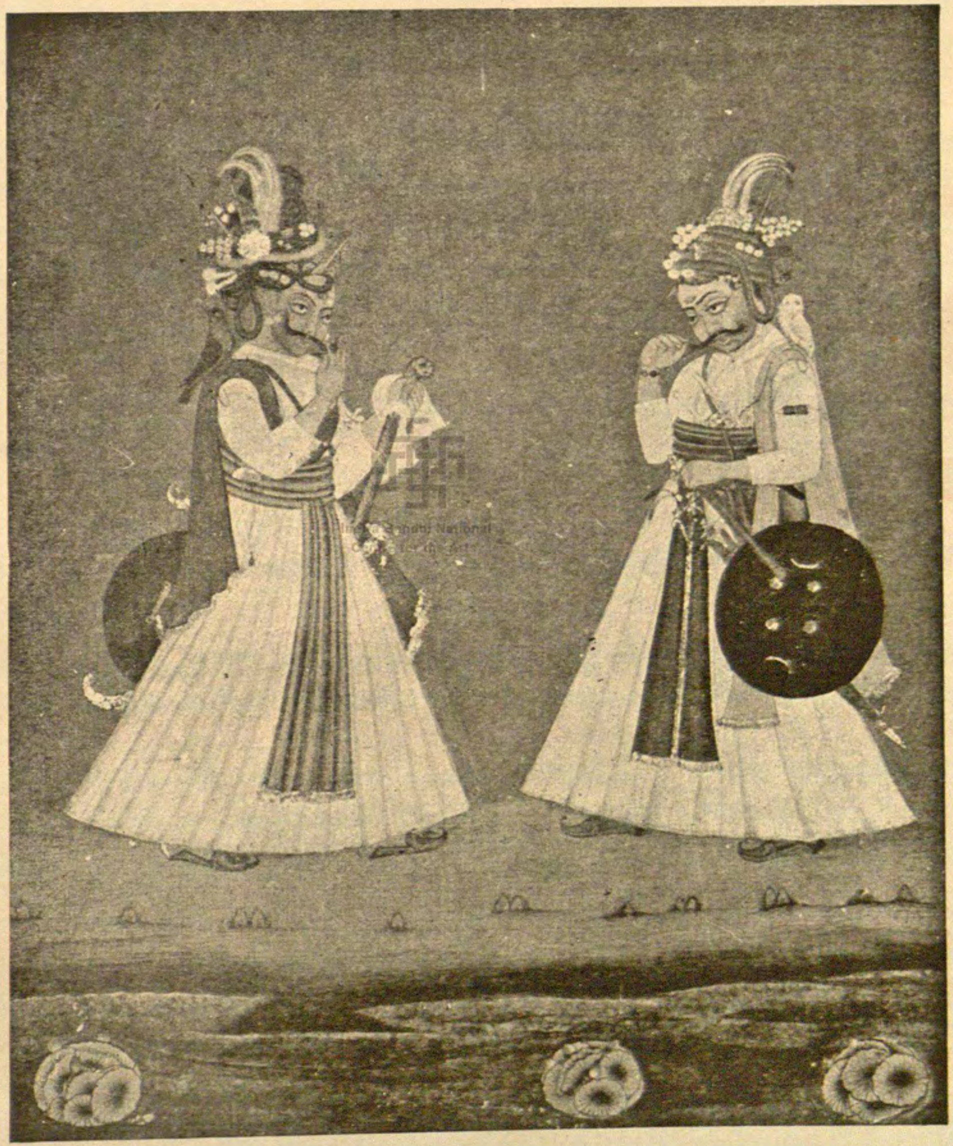
Top : War—Horses
Below Left : Shield
Right : Shield and trident (after Griffiths)



War Scenes from Indian Paintings

Top Left : Warriors holding spears; Ajanta
Right : Cavaliars on boat; Ajanta
Below Left : Mughal Warrior
Right : Boat; Ajanta.

Plate XVI



CONFRONTING WARRIORS,
RAJASTHAN, EARLY 17th Cent. A.D.

(Collection : National Museum, New Delhi.)

breast-plates of iron are seen arranged in succession in between the wagons to shield the musketeers. Behind the artillery is stationed the advance-guard. Babar himself is seen in the centre, flanked by his valiant soldiers.

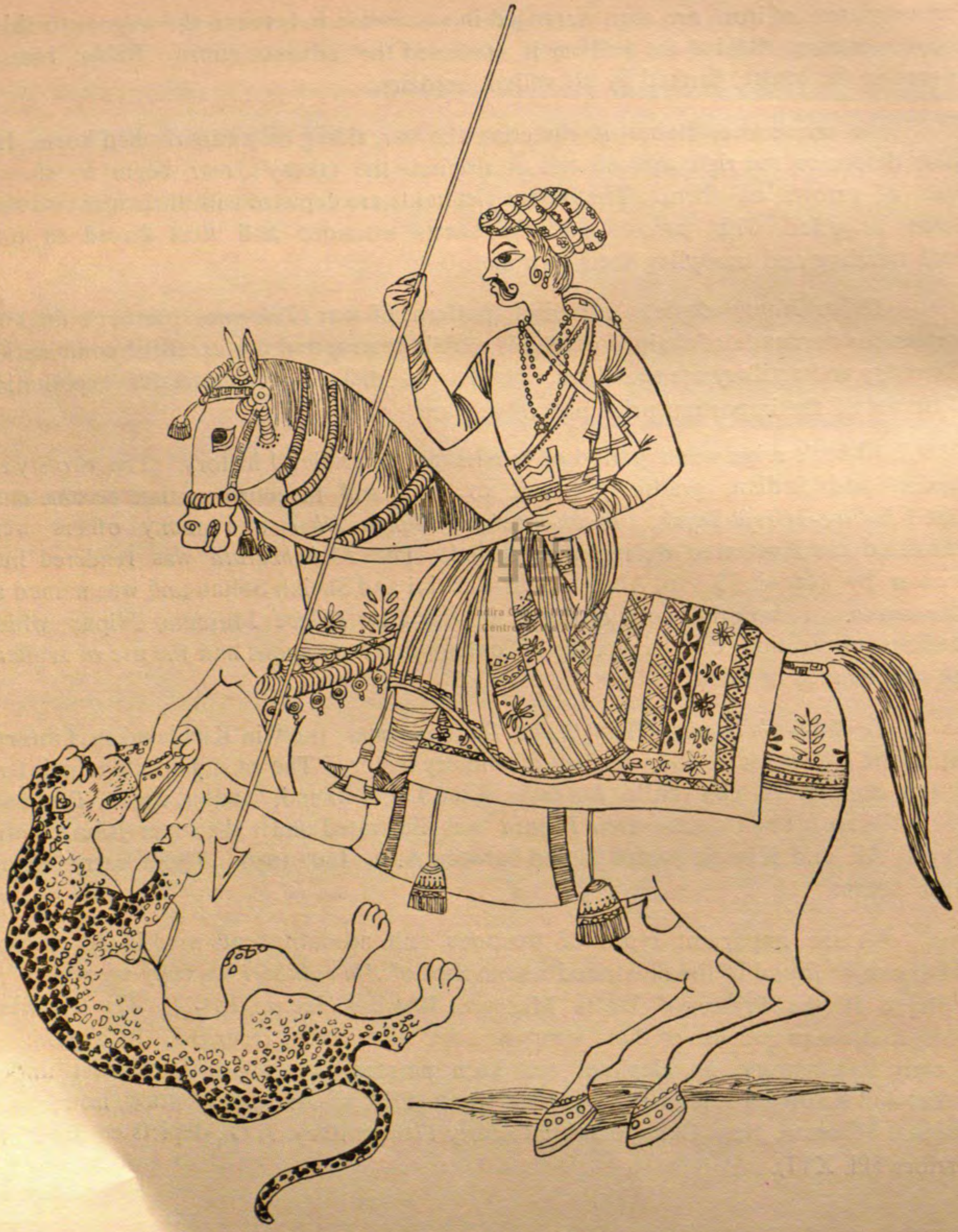
In one scene, Babar is directing the war, riding on a caparisoned horse. His units detour on the right and left and on reaching the enemy's rear begin to shower rain of arrows on them. The Indian elephants are depicted with their mahouts shot down or galled with arrows and the beasts wounded and thus forced to turn back treading and trampling their own men.

Babar Nama depicts a typical pattern of war (*Tulugma*). Babar's flanking parties, his barricade of chained carts, his mobile reserve and the excellent combination of cavalry and artillery are seen here. It gives a picture of successful exploitation of almost all the important principles of warfare.

Akbar's reign was a period of renaissance in medieval history. The two styles, Persian and Indian, gradually began to fuse and in course of time became one. *Zich-i-Jadid-e-Miraji Tajak*, *Tuzuk-i-Babari*, *Ganga Dhar* and many others were translated and illustrated during this period. The *Mahabharata* was rendered into Persian by Naquib Khan, Abdul Qadir Bahaini and Sheikh Sultan and was named as *Razmnama*. A beautiful copy of this is in the City Palace Museum, Jaipur which contains illustration of war scenes. Contemporary weapons and the use of artillery can also be seen in this.

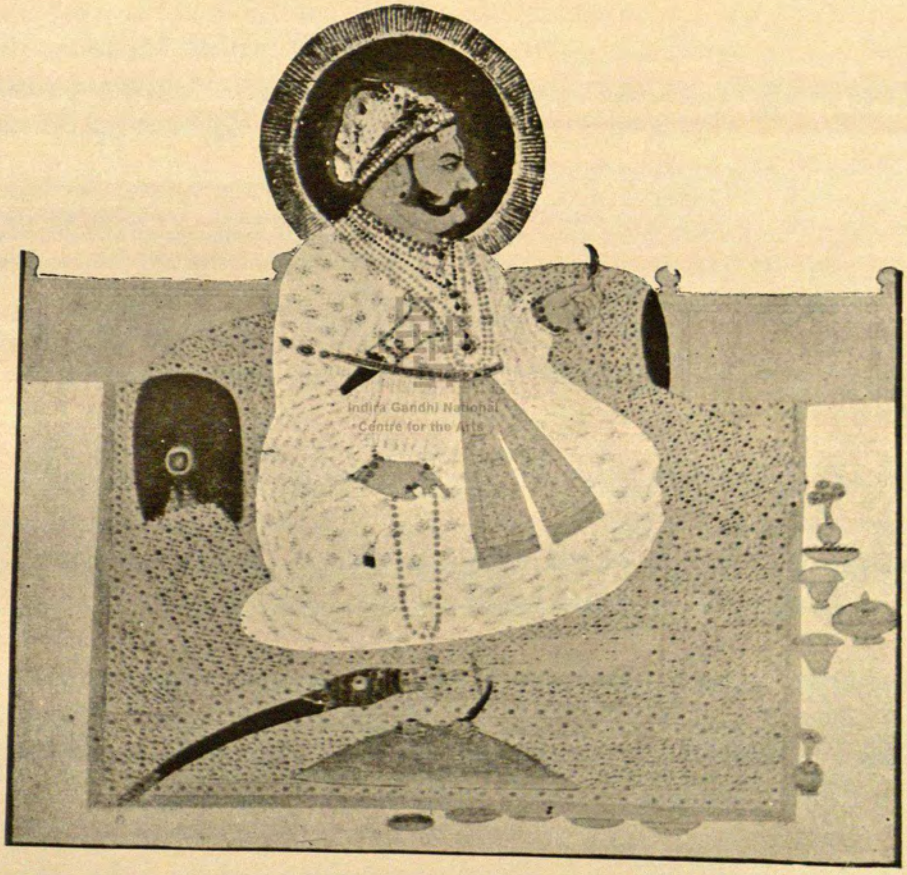
Tarikh-i-Khandana-i-Timuria and *Badshahnama* (now in Khudabaksh Library, Patna) are indispensable for a student of military history. The most important painters of this time were Daswanth, Basawan, Kesu Lal Mukund, Madhu, Jagan, Tara and Khem Karan. The *Dastan-i-Amir Hamza* was illustrated under the supervision of Mir Sayyid Ali and Khwaja Abdul Samad between A.D. 1567-1580. These carry many battle scenes.

All the important types of weapons and accoutrements used in the time of Akbar can be found in the illustrated manuscript of *Ain-i-Akbari*—a copy of which is displayed in the Prince of Wales Museum, Bombay (See pp. 161-2). The technical names and the proper use of these weapons have also been recorded. In a painting of early 16th century, an elephant has been painted crushing a horse-rider under its feet and holding a soldier in its twisted trunk (Pl. XV). Another painting, now in the National Museum, New Delhi, datable to early 17th century A.D., depicts confronting warriors (Pl. XVI).



Rajput warrior holding a long spear; Painting, *c.* 18th century

Plate XVII



A RAJPUT WARRIOR WITH HIS SWORD, SHIELD AND DAGGER, JAIPUR, 18th Cent. A.D.

(Collection : National Museum, New Delhi.)

Mughal painting reached its peak under the patronage of Jahangir. Every incident of his life was painted. Shah Jahan, though a great builder, promoted painting also. During his period, the Portuguese traders were a thorn in the eyes of the Mughal Government. They engaged themselves in detestable slave trade. They incurred the displeasure of Mumtaz Mahal by detaining two of her servant girls. Shah Jahan ordered Kasim Khan, the Governor of Bengal to rout them. The siege of Hoogly which began on June 24, 1632 ended three months later in the capture of the place. This is very skilfully portrayed in a painting where most of the ships were shown lost but a few reached Sangat Island where an epidemic destroyed a large proportion of the survivors. In one miniature painting of *c.* 1740 A.D. Shah Jahan has been portrayed holding a very long spear. The army operations have been shown in the background (Pl. XIX).

Aurangzeb being a puritan, painting rapidly declined in his reign. With the disintegration of the Mughal Empire, capable painters migrated to Avadh, Hyderabad, Mysore and Bengal. In Rajasthan, however, painting continued to flourish. In most of Rajput paintings war scenes and weapons can be easily discerned.

The National Museum, New Delhi has in its possession some rare manuscripts containing war scences. *Yusuf Zulekha* written by Maulana Abdul Rehman Jani in 9th century A.H. contains battle scenes in which the king is seated on a 'howdah' fully equipped and being escorted by his soldiers. The illustrated manuscript *Khamsa-i-Nizami* of Muhammed Mumin dated 996 A. H. (A. D. 1588) contains dramatic war scenes. Horse-fighting is specially noteworthy; the dead soldiers, wounded horses and the heroism of the warriors have been boldly portrayed. The fight with camels can be seen in the '*Laila Majnu*' written by Katib Mustafa. The *Shahnama* of Firdausi is a treasure house with minor details of battle arrays, camping and drilling. The National Museum, New Delhi has several copies. The one dated 1060 A.H. is fully illustrated. The war tactics of the medieval Sultans have been remarkably sketched. The soldiers are fully armed with armours and so protected were the horses and elephants. *Mehr-o-Mushtari*, *Bhagwata Purana* (Devanagari script), *Mahabharta* (*Udyoga Parva,* 18th century A.D.), *Durga Saptasati* (miniature copy), *Kalpasutra* (Illustrated), *Bhagwata Purana* (late 18th century) are equally interesting manuscripts for the study of warfare in India. The history of Nizams of Deccan has been described in *Tuzuk i-Asafiya*. (12th cent. A.H. = 18th cent. A.D.). In folio No. 47 the fighting forces are facing each other. A big fort is being bombarded by the artillery and cannons on wheels. Horses and elephants are fully protected with armours. The chariots are not to be seen at all. Their utility in the battle was no longer advantageous. *Darab Nama* containing the paintings of Kashmir School A.D. 1797 is an informative treatise for our study.

Pahari painting mirrors a variety of arms. In one miniature Prince Aniruddha has been shown with his courtiers. Swords and *peshaquabjs* are seen here. A Rajput warrior with his sword, shield and dagger can be seen in a painting of Jaipur School, now in the National Museum, New Delhi (Pl. XVII).

The Deccani, Maratha and Sikh Schools of paintings are equally rich with war episodes A close study of these miniatures is sure to provide illuminating accounts of the military traits of the then soldiers.

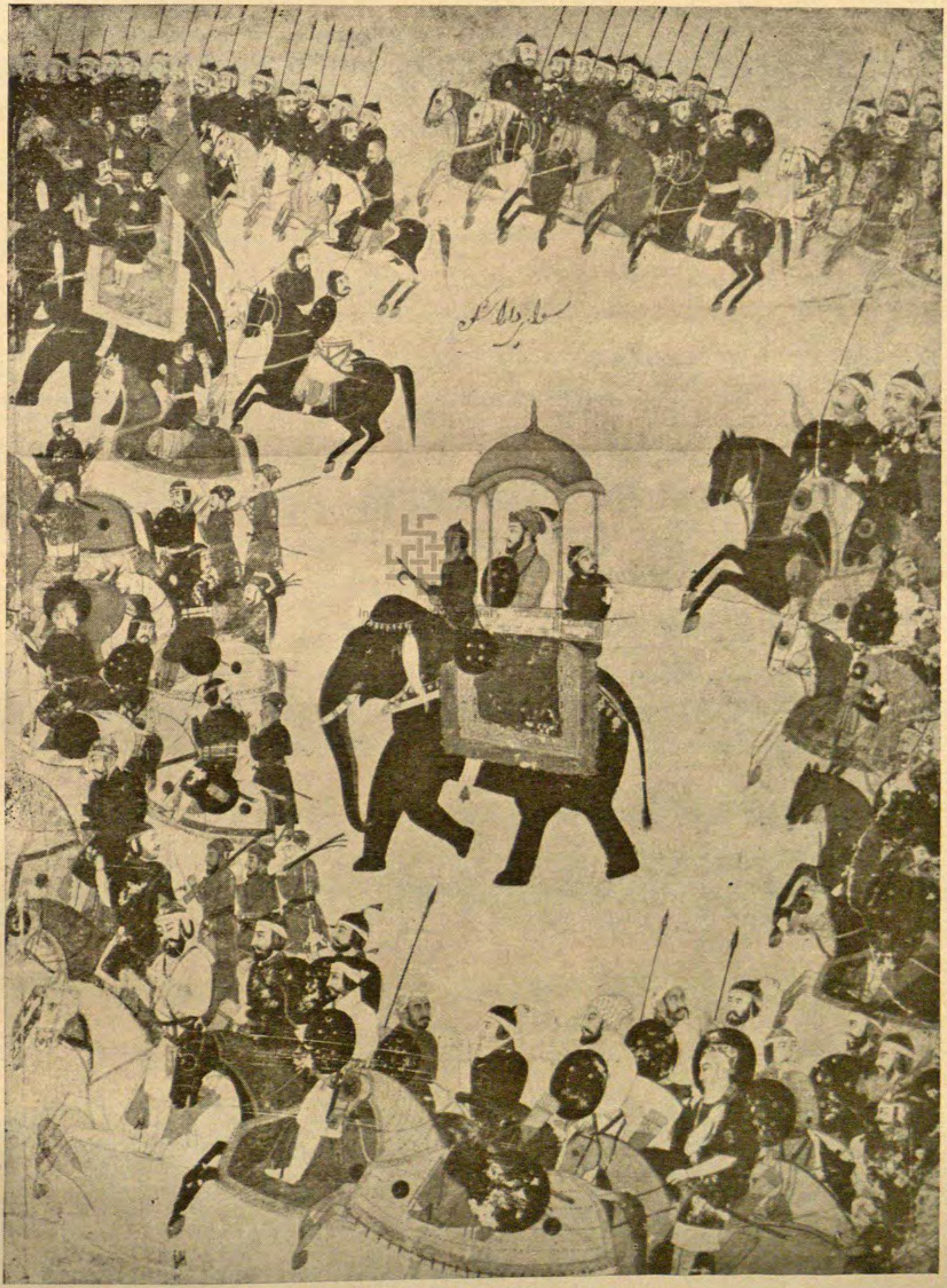
The beautiful creation of the artist Chetu, namely, the 'Rape of a Yadava woman', of 19th century (previously in the collection of Shri N.C. Mehta) shows Arjuna holding his *Gandiva,* helplessly. His fight with the tribal people is quite remarkable. One painting of the Red Fort Museum, Delhi depicts Dara with his army (Pl. XVIII).

In brief, the study of Indian paintings will provide an excellent source material to a student of weapons and warfare.

For further study

1.	Anand Coomaraswamy	*Rajput Painting* (1916).
2.	Anand Coomaraswamy	*Catalogue of the Indian Collection in the Museum of Fine Arts, Boston,* Part V (*Rajput Paintings,* 1926.)
3.	Abul Fazl	*Ain-i-Akbari.*
4.	Brown, W.	*Paintings of the Jain Kalpasutra* (Washington, 1934).
5.	Brown, P.	*Indian Painting,* 5th ed. *Y.M.C.*A. (Calcutta, 1947).
6.	Biyon, Wilkinson & Gray	*Persian Miniature* (London, 1933).
7.	Garde, etc.	*The Bagh Caves* (1926).
8.	Griffiths	*Paintings of the Buddhist cave temple of Ajanta* (London, 1897).
9.	Hendley, Th. H.	*Memorials of the Jaipur Exhibition* (1833).
10.	Herringham, Lady	*Ajanta Frescoes* (London, 1915).
11.	Khandalwala, Karl	*Pahari Miniature Paintings* (Bombay, 1958).
12.	Khandalwala, Karl	*Indian Sculpture and Painting* (Bombay).
13.	Kuhnel and Goetz	*Indian Book Painting* (London 1926).
14.	Lalit Kala Akademi	*Krishangrah Paintings* (New Delhi, 1959).

Plate XVIII



DARA SHIKOH ON THE MARCH,
MUGHAL, 18th Cent. A. D.

15.	Marshall and Foucher	*The monuments of Sanchi*, Vol. II.
16.	Martin, F.R.	*Miniature Paintings and Painters of Persia, India and Turkey* (London; 1912).
17.	Pope, Arthur Upham	*A Survey of Persian Art*, Vol. VI. (Plates) Oxford, 1938).
18.	Rai Krishan Das	*Mughal Miniatures*, Lalit Kala Akademy (New Delhi, 1955).
19.	Sivaramamurti, C.	*South Indian Paintings*, National Museum (New Delhi, 1969).
20.	Yazdani	*Ajanta*, Part I (London, 1930).
21.	Khullar, G.D.	Indian Miniatures (New Delhi, 1967).
22.	Dewdney S. and Kidd, K.F	*Indian rock paintings of the great lake*,(Canada, 1962).

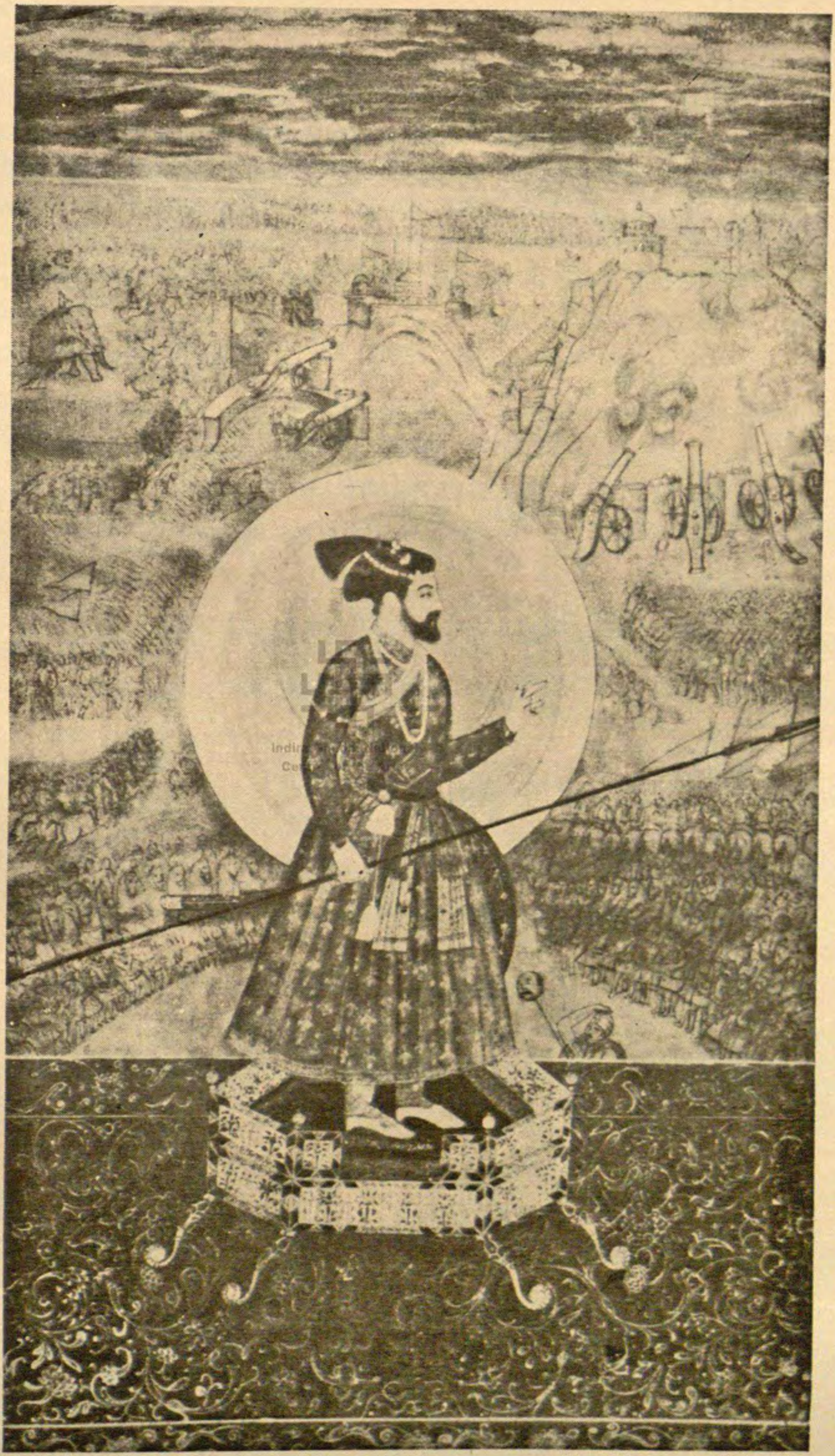
DECORATION ON INDIAN ARMS

Decoration on arms is an interesting study. Weapons used by the royalty and persons of high status, were usually embellished with decorative designs. In India, giving presents at the royal *durbar* and at public receptions to distinguished personages in recognition of their services, was an important function from ages past. The sword was the usual present given as an emblem of military prowess and status.

The edged weapons like swords, daggers, spears, etc., were profusely decorated with geometrical and floral patterns and hunting scenes; favourite subjects being common flowers like lotus, the indigenous birds like the parrot, the peacock, etc. The swords from the Punjab, Kashmir and Rajasthan bore these naturalistic decorations. When figures of men and beasts were engraved they were accurate and faithful. Sometimes, figures of gods and goddesses in relief were also chiselled on the flat surface of the steel blade. The lion, the tiger, mounted horseman, duel between a man and an animal and war-scenes were frequently depicted.

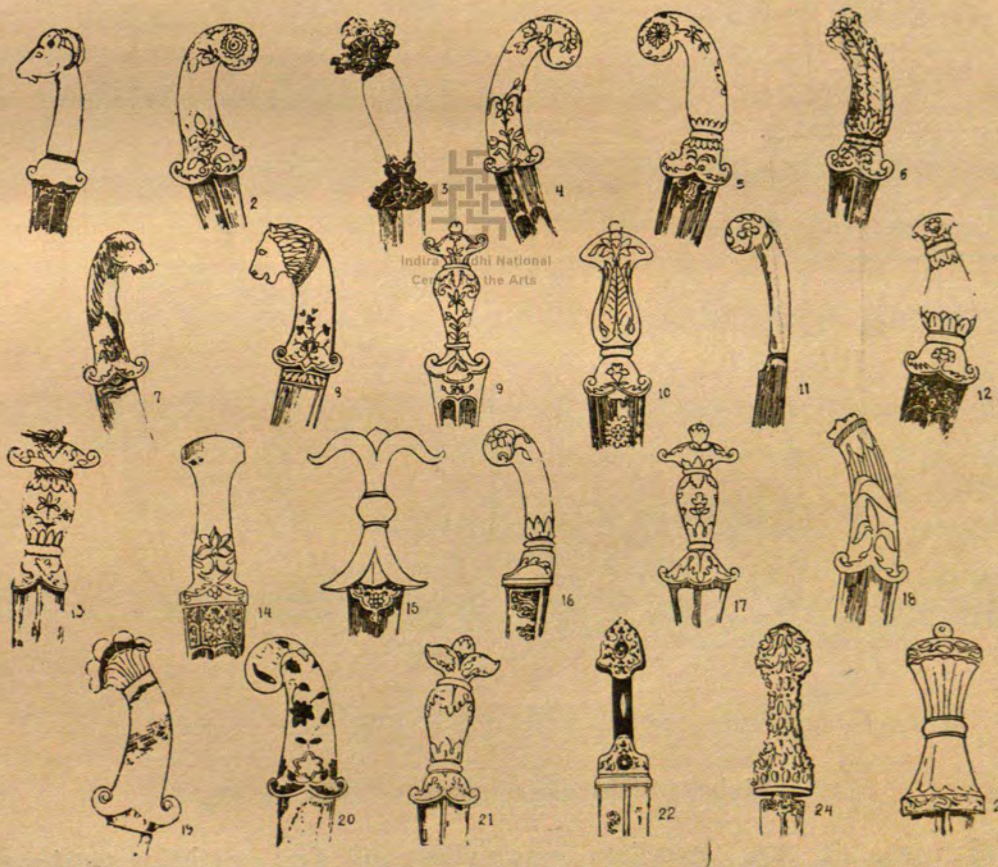
There are inscriptions mostly in Arabic and Persian but sometimes in Hindi (Pl. VIII) and other regional languages too, Historical weapons bear the names of their owners. Inscribed sword of Alauddin Khilji is in the Prince of Wales Museum, Bombay and that of Raja Man Singh in the City Palace Museum, Jaipur. The swords of Shah Abbas, Jahangir, Aurangzeb (Pl. X, fig. 3), Ahmad Shah Abdali, Nana Rao Peshwa, Rana Hamir Singh, Tipoo Sultan (Pl. XII), a *Khanda* (Pl. X, fig. 2) and two daggers of Aurangzeb and the battle-axe of Nadir Shah are the priceless treasures displayed in the Gallery of Arms, National Museum, New Delhi (Pl. XXXVIII). Inscribed shield of Akbar is exhibited in the Prince of Wales Museum, Bombay. In every museum such specimens are available. One shield has been inscribed in relief with the verses from *Gita* and is preserved in the National Museum, New Delhi. Similarly, one coat of mail is here in which each ring is inscribed. It was a common practice to inscribe verses from the Holy Quran and also the names of Muhammad, Ali, etc. The names of the makers, dates and place have also been recorded. Most of the heavy cannons bear all these details. Inscribed arrows are to be found in the Tanjore armoury, Tanjore. Trade marks such as a flower, an umbrella, an animal, etc., were also engraved. All the genuine swords made by Asadullah, the noted swordsmith of Persia, bear roaring tiger as his trade mark. Talismanic diagrams form a frequent motif. Squares enclosing four letters of even number in Arabic, in addition to the name of the maker, represented the divinity and strength.

Plate XIX



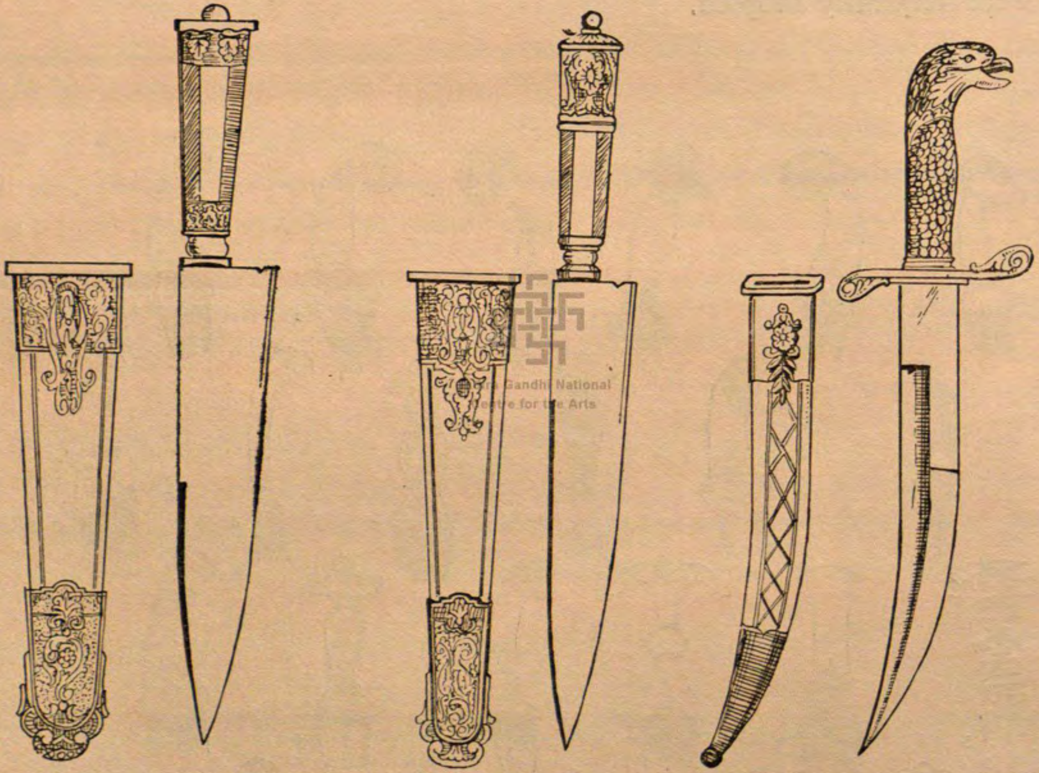
SHAHJAHAN HOLDING A SPEAR,
Army operations in the background,
MUGHAL. C. 1740 A.D.

The hilt of swords and the handles of daggers were abundantly decorated. Sometimes the pommel itself was shaped like the head of a horse (Pl. XXVII, fig. 2), a ram, an elephant, a hound catching a hare, a lion fighting an elephant, etc. These show how cleverly their shapes were utilized for various decorative patterns and motifs. The designs were boldly drawn and were never confused or overcrowded. The lines were free and flowing. The scenes were taken from everyday life and subjected to a symmetrical arrangement, showing how far a conventional treatment could be carried without losing its spirit. The damascening, pattern-welding, enamelling, etc. discussed below, were frequently adopted.



Different enamelled, damascened, jewelled handles.
(National Museum, New Delhi).

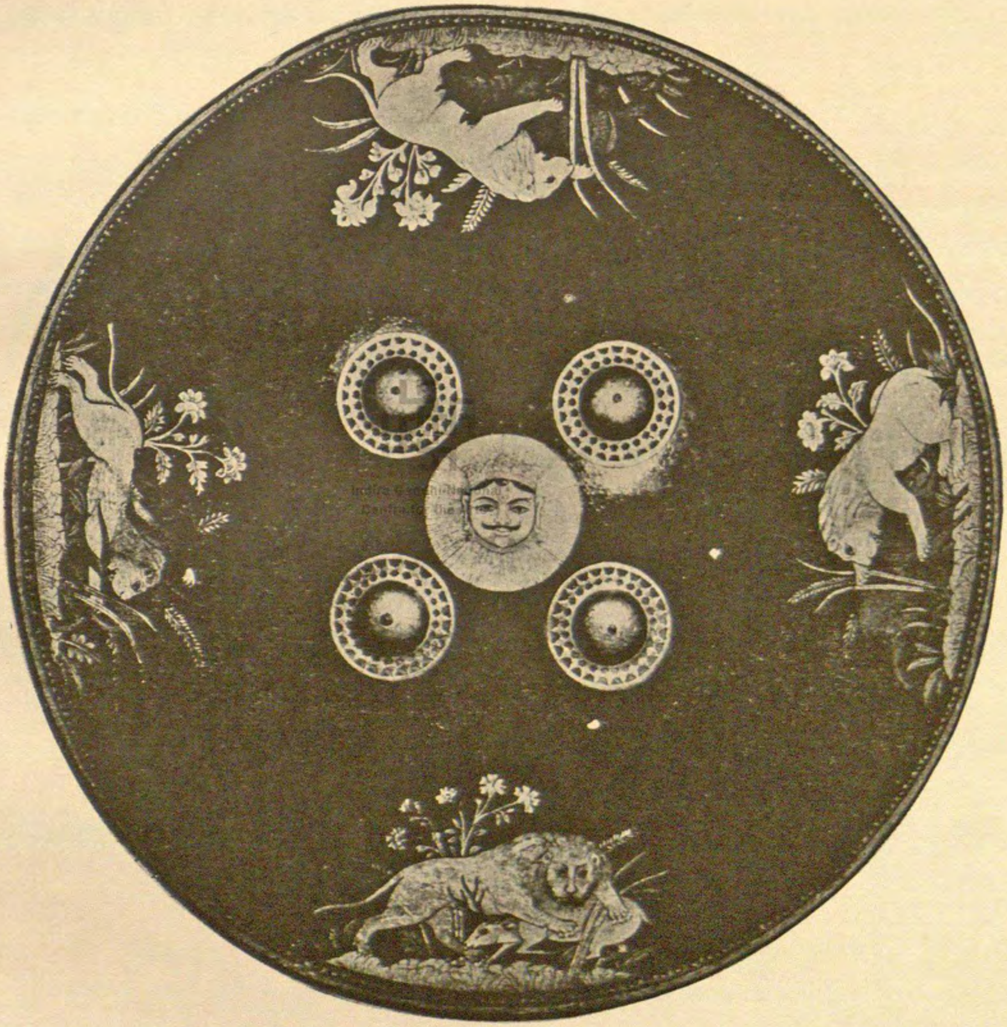
Scabbards, again, were ornamented. Those of wood were covered with colourful velvets and embroidered; the lacquered ones bore fine painted designs over them. These were fitted with upper, middle and lower covers which were perforated, damascened, studded with gems and finely engraved with floral and creeper designs (Pl. XIII). Leather belts were equally ornamented.



Knives with handles of precious stones.

Indian shields are excellent examples of fine artistic workmanship. These were painted all over and the minute details have been executed with great skill. The figures of kings, fighting and hunting scenes and the geometrical designs have been carefully drawn (Pl.XX). Shields of hide and leather were lacquered and then

Plate XX

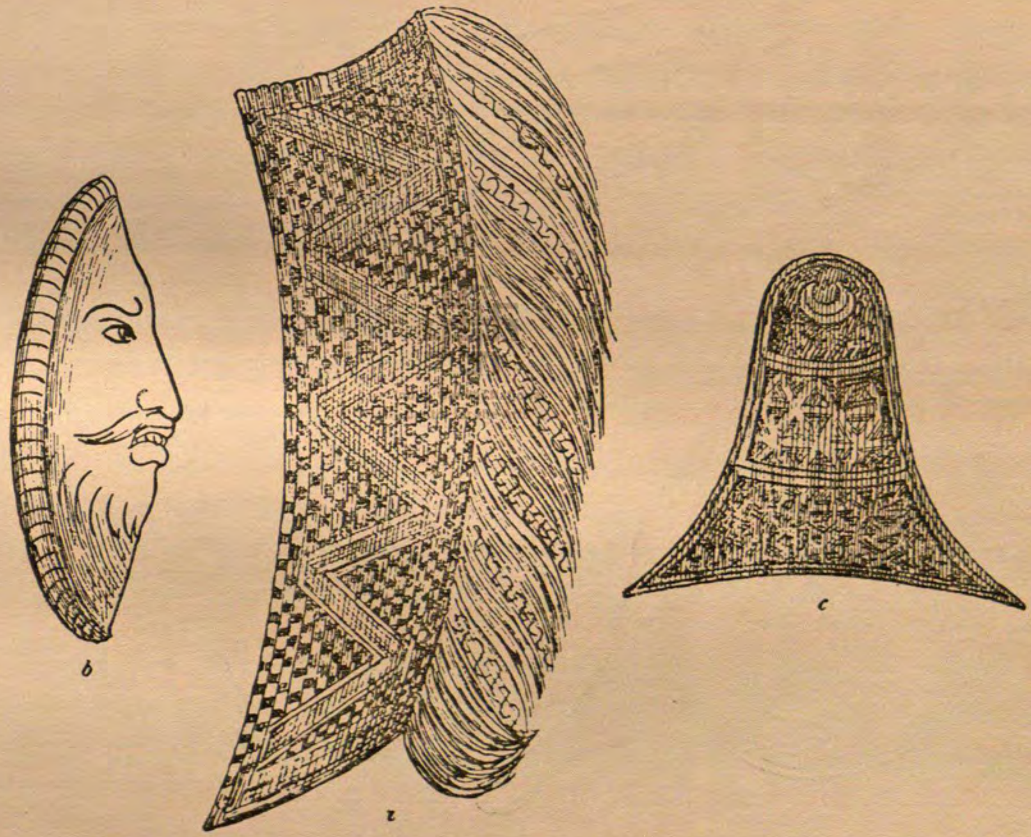


SHIELD DEPICTING HUNTING SCENES,
RAJASTHAN, LATE 17th Cent. A.D

(Collection : National Museum, New Delhi.)

painted; those of metal were engraved, enamelled, perforated, damascened or studded with jewels National Museum, New Delhi possesses several such shields and more than a dozen pieces which are on show, immediately catch the attention of the onlooker and enthrall him for a long time (Pl. XXI).

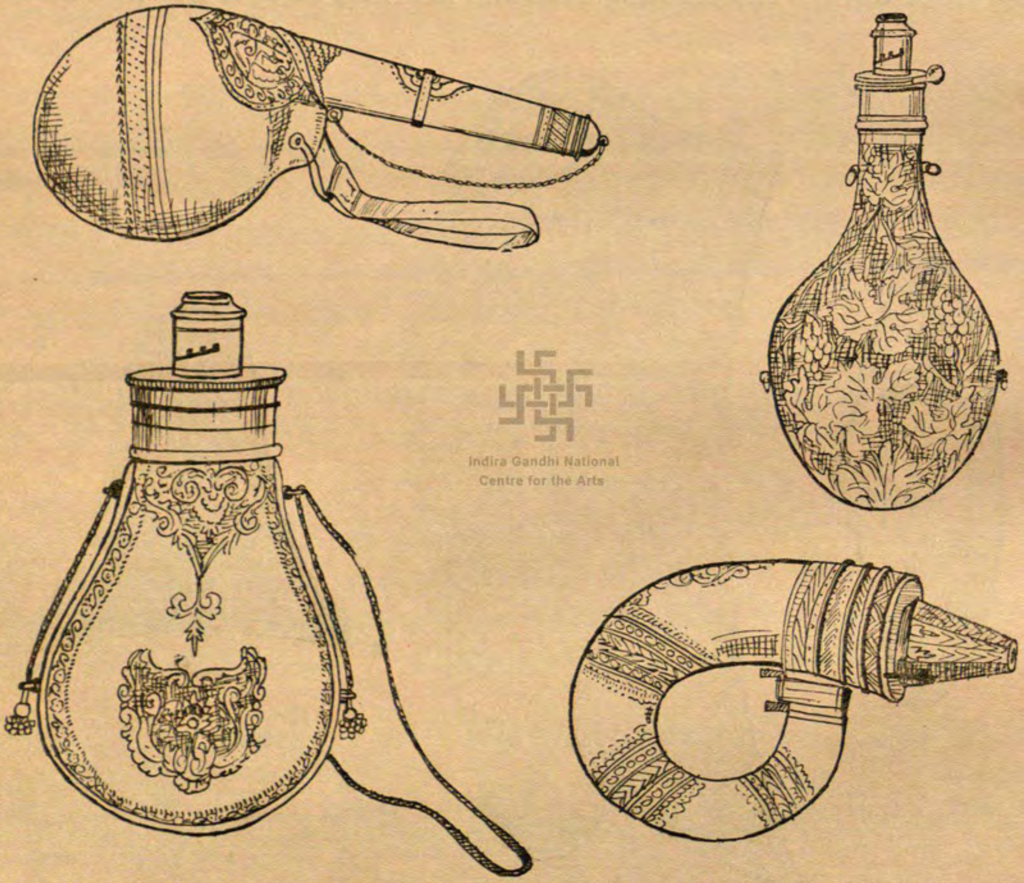
Armours were invariably ornamented. Being flat these allowed sufficient space for the artists to show their imagination The borders are mostly decorated with gold and silver work. The hilts engraved and inscribed all over are numerous. In the National Museum, New Delhi are several such body-armours, hand-guards, foot-guards (Pl XXXVI), helmets, (Pl. XXXVI), waist-belts, back-scratchers, etc., which are elaborately decorated. Special mention may be made of an armour piece for the protection of the back. This Rajput back-armour of early 17th century is a unique



Shield from Ajanta Paintings
(after Griffiths)

piece and though simple, it is studded with pointed iron nails all over (Pl. XLI, Top : right)

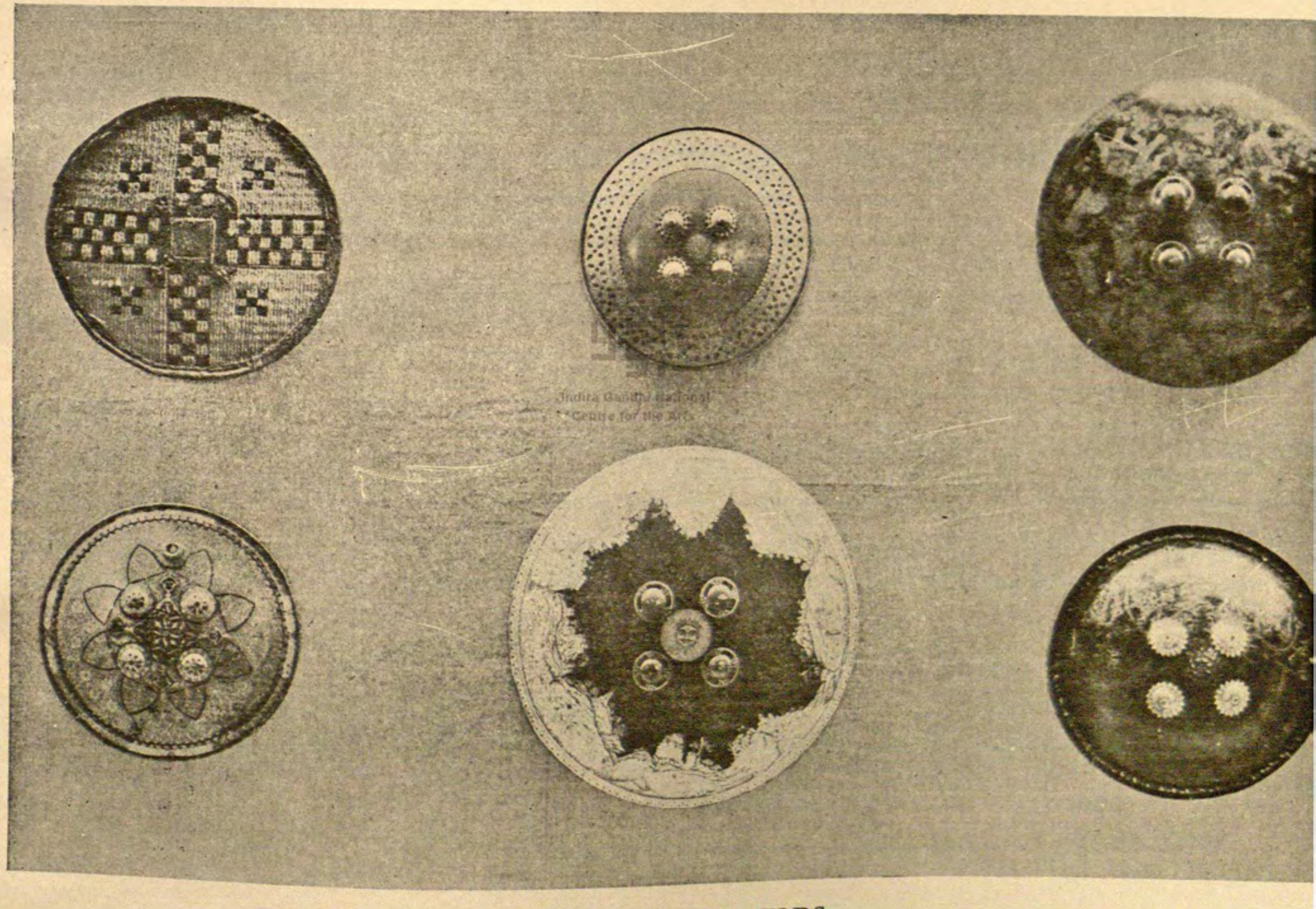
Wherever the form of the arms or accoutrement permitted, the Indian engraver took a fancy to exuberant decoration. In the powder-flasks several designs are seen



Decorated Gun-powder flasks.

Powder-flasks have been shaped like an animal, a dragon and numerous other designs (Pl. XXIV). The powder-flasks of ivory are carved with tasteful decorations (Pl. XXV). Several such pieces are preserved in the Salar Jung Museum, Hyderabad, City Palace Museum, Jaipur, Alwar Museum, Alwar, etc. In the case of elephant

Plate XXI



DECORATED SHIELDS

Top : L. to R. BAMBOO, DAMASCENED STEEL, LACQUERED WORK,
Below : L. to R. GOLD-PLATED STEEL, RHINOCEROS SKIN, HIDE

(Collection : National Museum, New Delh

goads the handles were similarly decorated (Pl. XXIII). A separate panel showing the decorated arms has been displayed in the National Museum, New Delhi where delightfully decorated swords, many crutches, daggers, *guptis*, knives, etc., could be seen.

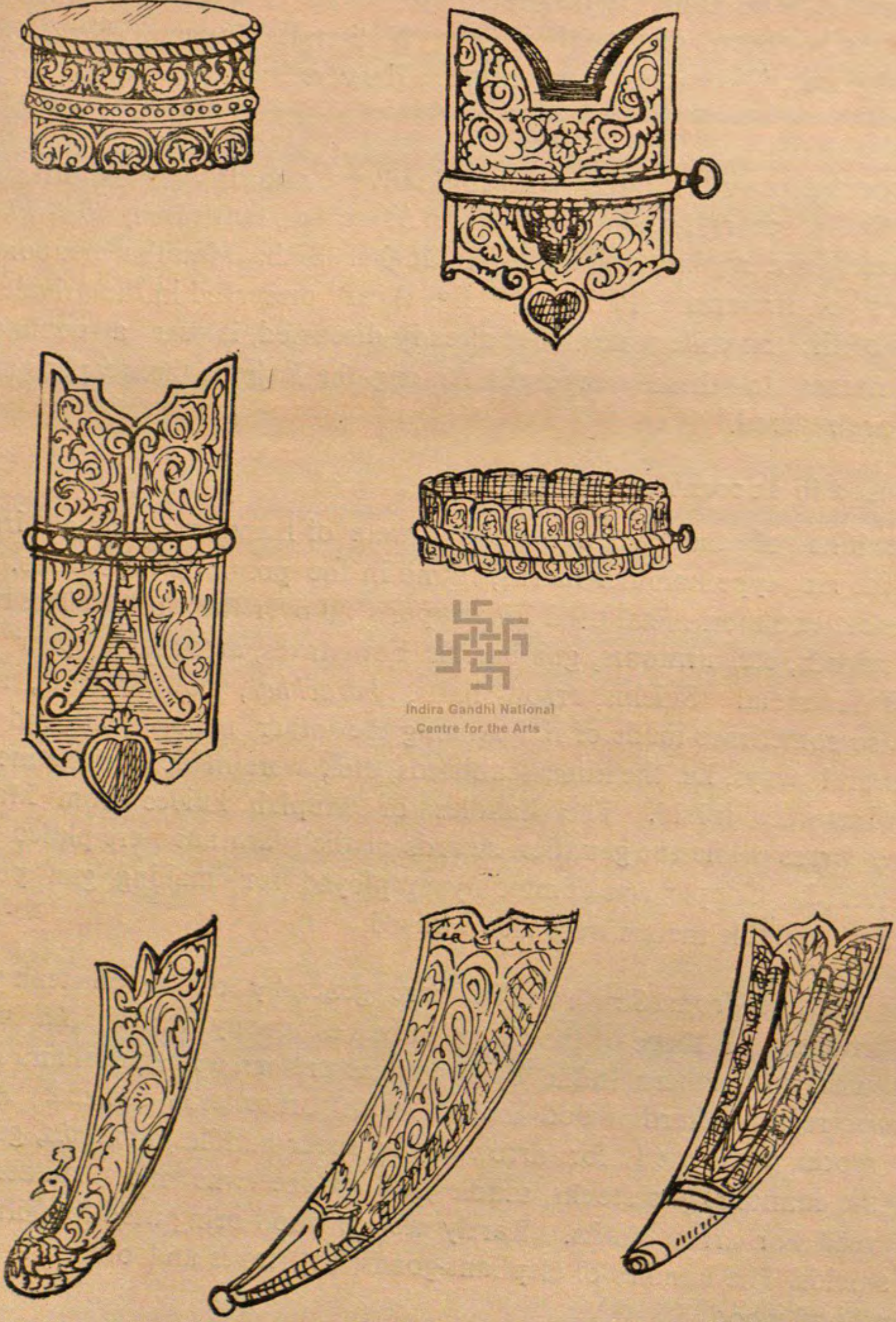
Decorated bows (Pl III), arrows and quivers, swords, daggers, dirks and knives (Pl. XXVI, fig. 1), spears, jevelins, *nezahs* and *barachhas*, battleaxes, axes, *khukaris* and *khadgas*, mace, *gurz*, *zaghnol* and *shaspar*, Mughal, Sikh, Maratha weapons and the several types of fire-arms (Pl XXXIV, fig. 2) are preserved in the private armouries of the kings of the erstwhile states. As already discussed, it was a common practice to assign names to these weapons. Among the Rajputs the weapons are regarded sacred and are revered.

Materials used in decoration :

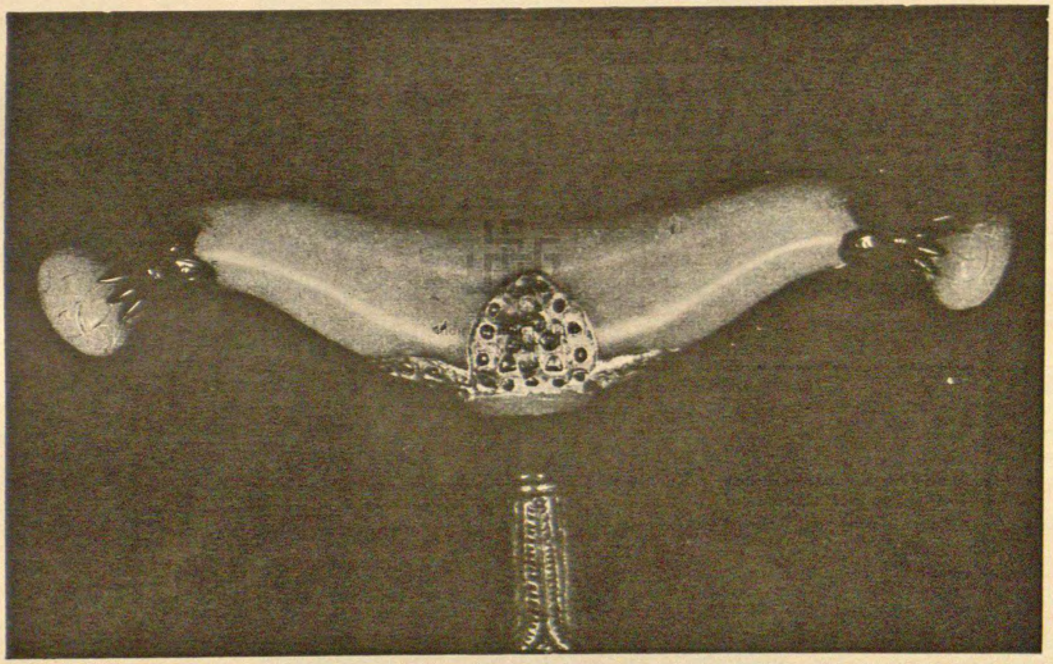
The hilts of the ancient weapons were of hammered wrought iron which is clear from the ring-type hammer marks, found in the pommels of swords. Steel was by far the most common metal used for weapons all over the world. The blades, hilts, handles of swords, etc., armours, gun barrels, bow-staves, arrow and spear points were generally of this metal Shields, arrow-shafts, *barachhas*, powder-flasks, *zafar takiya* etc., were also sometimes made of it. Among the other metals, gold and silver were used in several ways, i.e. the hilts, scabbards, etc., were made of these metals or gold and silver wires were inlaid. The handles of Muplah knives from Malabar were of engraved brass while the gauntlet swords of the Marathas were plated with bronze and then silvered. Copper was commonly employed for making gun powder-flasks. Tin and other available metals were also utilized.

The sheaths from South India were generally of carved teak wood plated with silver bronze while those of the Coorg knives of ebony wood. *Sal* and *shisham* have been used in northern India. Bamboo was preferred in Assam and NEFA while in the *Pahari* regions hard wood bound with brass was utilized. Apart from scabbards, wood was used for arrow shafts, spear handles, *howdahs*, gun carriages, tripods for the cannons, gun stocks, saddles, etc. Cane was most suitable for bow stave and reed for arrow shafts. Rarely we see wood being used for hilts of swords, and *Phari* shields. The handles of elephant-goads, battleaxes and other edged weapons were generally of wood.

Leather and hides were suitable for swords, belts, waist-belts, quivers, shields, powder-flasks, horse-trappings and scabbards. The hides of buffallo, rhinoceros



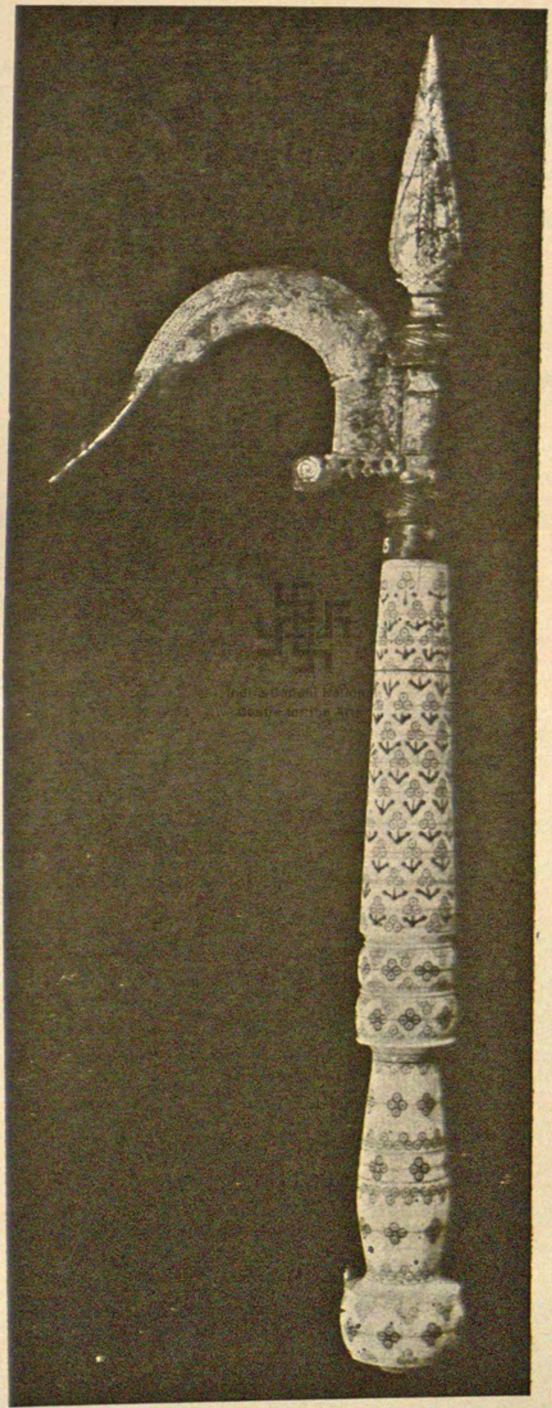
Decorated upper, middle and lower fittings of the scabbards.



JEWELLED HILT OF ZAFAR TAKIYA,
MUGHAL, EARLY 17th Cent. A.D.

(Collection : National Museum, New Delhi.)

Plate XXIII



IVORY INLAID ELEPHANT GOAD,
RAJASTHAN, C. 1750 A.D.

(*Collection* : *National Museum, New Delhi.*)

and elephant were specially recommended for shields (Pl. XXX). In the National Museum, New Delhi is a shield of crocodile skin and that of tortoise in the Durbar Hall, Junagadh. In Kutch, the hides were boiled so as to make them transparent and then they were gilded and painted. There are suits of mail made entirely of rhinoceros skin.

Velvet came handy for covering the scabbards. The powder-flasks and bullet cases were likewise covered in velvet and embroidered. Velvet padded coat of mail studded with brass nails called *Jazarant* is sometimes used in combination with the one made of leather. The inside of the shields, armours, helmets were lined with gold brocade or velvet embroidered with gold threads *(Kimkhabs)*. Cloths of different colours have also been used in place of velvet. Silken and woollen cloths were equally employed for these purposes.

The handles and sheath-mounts were frequently of white and green jade inlaid with precious stones. Jasper, tusk of walrus, horn, ivory both white and stained green, mother of pearls, crystal, jade, fishbone, diamonds, rubies, emeralds and other precious and semi-precious stones were utilized as studs. Dagger hilts made of soapstones were imported from Ceylon. In the National Museum, New Delhi several weapons, either studded with these jewels or sometimes completely made of one of them, are displayed. Antelope horns tipped with steel were employed in hand-shields (*maroos*) and bone for dagger hilts and priming flasks. The Mughals had a fancy for ivory and it has been used for all types of weapons. The notches of arrow shafts, hilts of swords and daggers, handles of knives, spear shafts, all studded with ivory, can be seen. The most remarkable are gun stocks which were adorned with embossed metal work or with various designs, painted or otherwise inlaid with different materials. The butts had generally an ivory or ebony cap, and all over the stock, floral designs were engraved and ivory was inlaid. The handles from Sindh were of white glass to imitate rock crystal or inlaid with green glass to resemble emeralds.

Lac was employed for colouring the lettering in sacrificial axes of northern India. Shields of Rajputs and Mughals, wooden scabbards and handles of the elephant goads were also lacquered. Three plumes of black heron's feathers adorned the helmets of the Sikhs and those of peacock beautified the helmet of the Rajputs. In short, all the available and known metals, wood clothes, jewels, minerals, bones, horns, hide, etc., were employed in the art of decoration. Tortoise shell was the material for the shields of Rajasthan. Gujarat warriors and the soldiers of Kashmir, Punjab and Bombay used *papier mache* for making shields which were richly lacquered and varnished. Hair was tied round the Naga spears and *Zari patta* on the Maratha lances.

Technique :

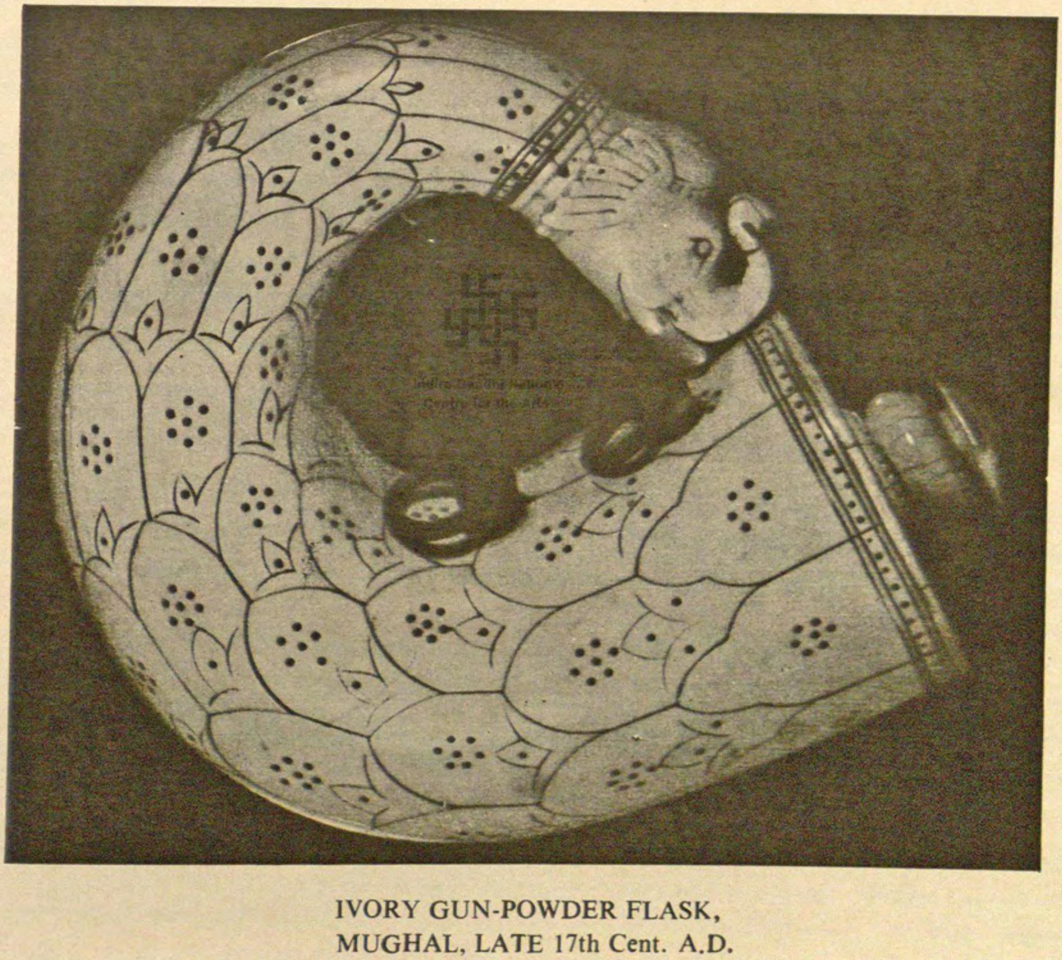
Among the techniques of decoration the damascening is worthy of mention (Pl. XXVI, fig 1). It is concerned with the composition and heat treatment of the cast steel billet from which the blade was made. 'The fine watered pattern in a sword made by the damascening process is due primarily to the heat-controlled crystallization of a steel which is rich in carbon, slowly cooled down from the liquid condition and forged at about, but not much above, a cherry red heat— ....this crystallization is the work of Nature, not of man[1]."

This process has been given different descriptions such as 'the undulations of the steel resemble a net across running water' ; 'the pattern runs like a skien of silk through the length of the blade'; 'waves like a watered steel', 'mottles like the grain of a yellow sand', etc.

The earliest known examples of smelted iron have been discovered from Asia Minor and dates back to the third millennium B.C. from where it found its way into India. In 326 B.C. Alexander received with other things a mass of 100 talents of Indian steel. Naturally, it must have been something exceptional and highly prized in Greece in that time. Even in Europe the Indian steel was famous for its quality. The Indian steel ingots were exported to Persia, Syria and East African ports from where they were sent to Europe. Diocletian (A.D. 245-313) founded his factory at Damascus in Syria. Soon it became famous for its technique which was later on known as 'damascene-work'. But the steel was not Syrian as it was imported from the Nirmal district in Hyderabad to Syria via Cutch. This high quality peculiar to the steel from Nirmal was responsible for the fine damascening work ; steel from elsewhere, would have never yielded such fine results.[2]

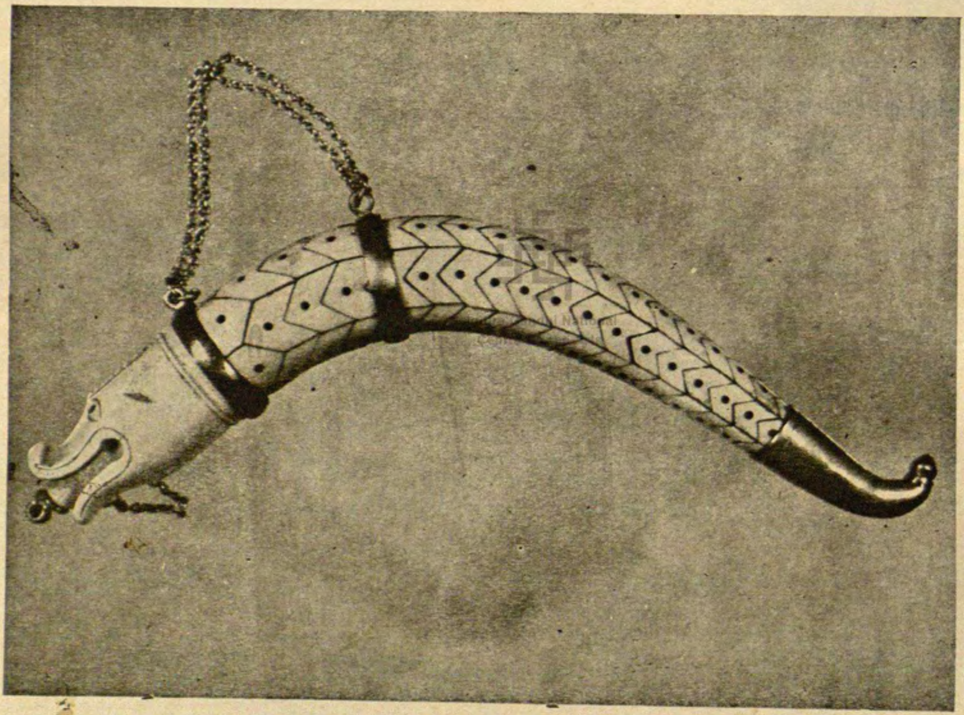
Till the 12th century the art was in its initial stages. The best blades have been produced in India and Persia in the 13th and 14th centuries In 1399 A.D., Timur, the Mongol conquered Syria and carried with him all the skilled workmen and put them to work in the factories established at Ispahan, Khorassan and Samarkand Thus, Damascus lost its importance and Persia became the great supplier of swords. Even then the Indian blade was used but was known as the 'Damascus Steel'. Marcopolo called it *Ordanique* in Russia it was termed *bulat*, in Europe *Wootz* and in India

Plate XXIV



IVORY GUN-POWDER FLASK,
MUGHAL, LATE 17th Cent. A.D.

(Collection : National Museum, New Delhi.)



IVORY GUN-POWDER FLASK,
MUGHAL, EARLY 18th Cent. A. D.

(Collection : National Museum, New Delhi.)

Faulad. Steel ingots were prepared in India itself. In the 13th century the finest steel producing centres were Kona-Samudram and Dundurthy, 25 miles south and 14 miles east of Nirmal in Hyderabad, respectively.

Here, to the local magnetic schist was added haematite and the black ferruginous sands found on the river banks. These were mixed with the ferruginous quartzites and schists obtained from Indore in the proportion of 3 to 2. The ore was crushed and ground to a coarse sand and in order to separate it from powdered quartz and other useless material it was either washed in running water or winnowed. Herbert Maryon describes a furnace at Kona Samudram which was eight feet one inch high and wide and tapered to a hole at the top about eight inches in diameter. It was made of ordinary clay mixed with husk and straw.[3] "Fuel and ore were tipped into the hole at the top of the furnace, and an air-blast was directed downwards from four bullock-skin bellows located near the top. These bellows were plied night and day, the men being relieved every four hours, until the ore had been reduced to a spongy semi-malleable lump. The 'bloom' was removed from the bottom of the furnace and cut into pieces weighing about ½ kilogram while still red-hot. It is important to note that these primitive furnaces did not attain a temperature sufficiently high for iron to become fully liquid, but only sufficient for it to consolidate itself into a pasty lump mixed with slag and the bloom. In the early stages of iron technology weapons were forged directly from this bloom".[4]

This cast iron was very fragile so the pieces were covered over with clay and reheated almost to the melting point. This was repeated many times. The excessive carbon was burnt and reduced to the correct level. The micro-analysis of the damascening of a 17th century Indian dagger revealed almost similar observations. In the words of Maryon, "We notice first that the surface of the blade is covered with a confused, curiously rippled pattern, with many streaks, swirls and eddies quite unlike the more orderly twists and parallel strips of the pattern-welded blades. There are many cloudy patches, which, when examined with a microscope, are seen to be composed of innumerable small, light-coloured spots or whirls. They are arranged on the surface and through the mass of the dagger in more or less parallel streams, close together with the central ridge of the blade and spread out to cover wider areas near its edges, where the metal has been flattened out more ....The amount of carbon in the steel for a fine 'Damascus sword-blade' would be no more than from 0.5 to 1.7 per cent, or less than half an ounce in one sword blade."[5]

Another method to heat black magnetite ore was to smelt the ore to give wrought iron, which was heated and hammered to free from it slag and broken up into small pieces (The Persians generally used iron bars, heated with charcoal or plumbago). The carbon was obtained from bamboo and the leaves of certain plants. This was piled up in a crucible and heated in a furnace for about two and a half hours. The ore was reduced to iron, which then began to absorb carbon. When it had absorbed 3 to 4 percent, the melting point was lowered sufficiently for the molten iron to fuse into a 'button' of metal which was either heated and cooled again four or five times or was left in the furnace and allowed to cool down with it very slowly over a period of days. At the end of the process a round cake of metal was obtained about 5 inches in diameter and 2 pounds in weight, sufficient for two sword blades.[6]

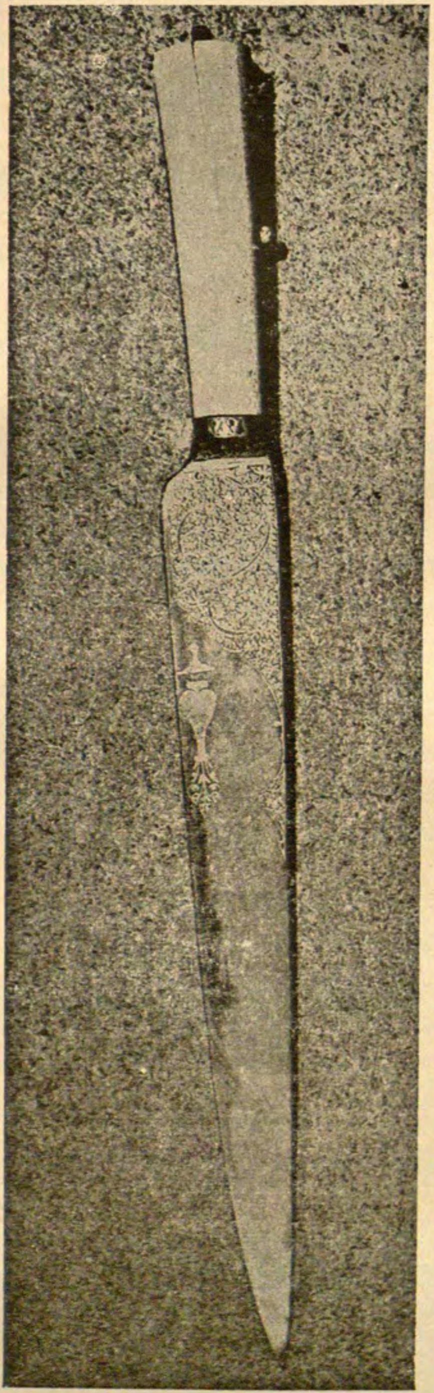
"It was not easy to forge, but a skilled smith with extreme care could avoid cracking in the initial forging process, since the brittle material was no longer in continuous planes of weaknesses (as in cast iron) but dispersed in tiny dots. Methods of working varied. One was by flowing the metal in two or more directions by hammer blows, followed by prolonged annealing and quenching while another was to work the steel at dark red heat without quenching."[7]

The blades were then 'cleaned'. This also necessitated long and careful work. A mineral called *Zag* was used in solution which was a natural ferric sulphate. The patterns which were originally visible were polished out of existence. But this can be seen by etching. The surface was 'filed' or 'scraped' and again some abrasive was employed. The scratches were filled up by minute particles. The surface then looked smooth and even.[8]

The quality of a weapon with damascene work was judged by its pattern. The blades with darker shades, dark bluish grey or black patina were highly prized. The finest work brought by the damascene process was called *Kirk Narduban* or 'Mahonet's ladder' (Pl. XXVII, fig. 2). In it the smith aimed at creating contour lines in various directions along the blade so that it had horizontal bands running across it at regular intervals, a most difficult effect to produce. These were not natural products but skilfully designed by the sword-smith. The darkness of the background and the golden lustre of the shining metal were other important features of the best blade produced by this process.

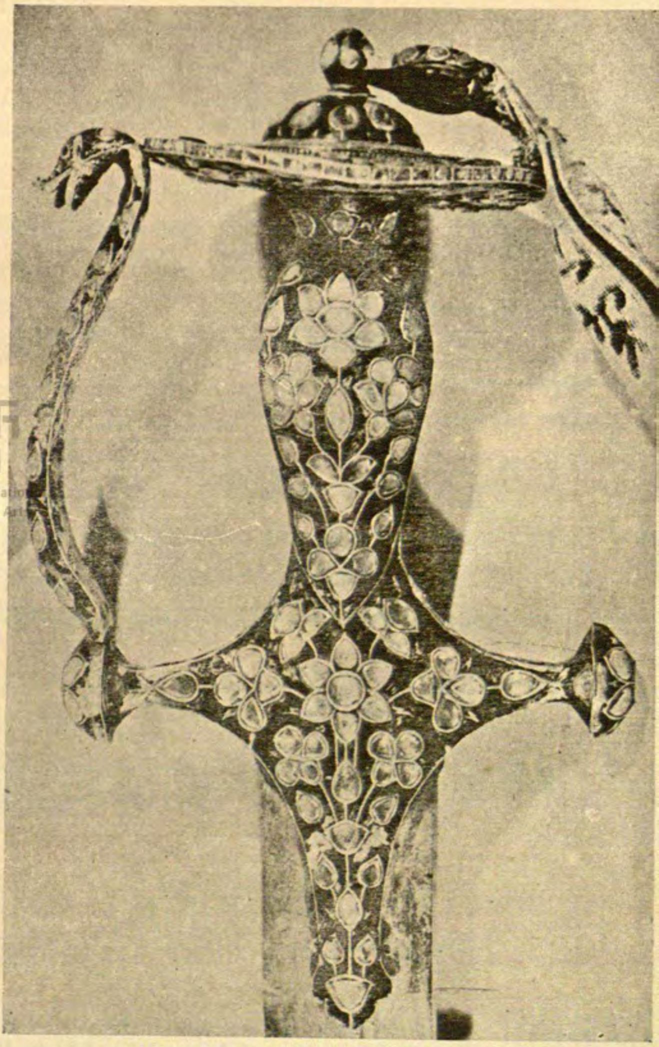
In the National Museum, New Delhi are preserved several swords, daggers, armours, spears, gun-powder flasks, etc. upon which damascening can be found. This was commonly called *Jauhar* (Pl. XXVII, fig. I). A dagger here with rock crystal handle and dark blade, bears a very delicate damascene work. Sometimes. different colours

Fig. 1



DAMASCENED DAGGER
(Inlaid at the both ends)
LATE 17th Cent. A.D.

Fig. 2



HILT STUDDED WITH JEWELS,
EARLY 17th Cent. A.D.

(Collection : National Museum, New Delhi.)

were produced by employing fruit juices. Thus, we have in the National Museum a dagger having golden bronze coloured blade. Specially noticable is the Mughal sword of early 17th century in which traverse lines are repeated at equal intervals throughout the length of the blade.

Pattern welding :

It was used for the strengthening and embellishment of the blade (Pl XXIX). It was a process of welding wires of iron and steel or patterns of composite strips of varying quality.[9] The main difference between pattern welding and damascening is that the necessary carbon was introduced not by heating the iron in a crucible, but by causing it to be absorbed into the surface of the solid metal. These were of three types-straight, herring-bone and curved.

Inlaying :

It is most unfortunate that inlaying has also been mistaken for 'damascening'. It is an ordinary skill, employed all over the world. This was not confined to weapons alone but could be employed on any metal for any purpose. In this process the hard metal surface was made rough by a series of shallow chisel cuts. A gold or silver wire or foil pattern was fixed firmly into it. It was hammered and then burnished. In many cases the projecting inlaid wire was beaten and burnished over the surface to join that to the next line of inlay. It has been wrongly called 'Damascening in gold or silver'. This was a common technique and in the early 19th century the blades made by this technique were exported from India to Europe under the name 'Damascus blade'. Even today such weapons crowd the Indian markets. The correct meaning of the two different techniques of 'damascening' and 'inlaying' should be properly understood.

The inlaying again was of two kinds. In the first kind of true incrustration called *Tah Nishan,* deep channels were cut in the steel, filled up with thick gold or silver wires which were hammered and beaten and made to adhere to the surface (Pl.XXVI, fig 1). In the second kind (*Zar Nishan)* the wire was hammered on the surface which had been slightly scratched to receive it.

With the increasing demands of showy and cheap things a new technique called *koft* (literally sorrow) was evolved in Punjab in the late 18th century.

Tula :

It was principally practised in Persia and was brought to India by the Mughals. In this technique, the scene is deeply engraved on the blade and a solution of silver, copper and small proportion of lead is poured into the design. The piece is then heated and rubbed over with borax, replaced again in the fire for a short time and then withdrawn and allowed to cool.

Ganga Jamuni :

In this ornamental work a very beautiful effect is produced by the combined use of copper and brass or silver, gold and brass. The best examples of this work are the shields preserved in the Central Archaeological Museum, Jaipur depicting scenes from the *Ramayana* and *Mahabharata.*

Ornamentation techniques :

Several other methods, sometimes combining with one or more techniques described above, were adopted to decorate the arms. The breast plates were divided by horizontal bands into several zones which were covered with foliage and arabesques in relief. The greatest amount of ornamentation was lavished upon armours. The large shields of damascened steel offered a rich field for ornaments in gold and silver work, the best of them were made at Delhi and Lahore. In the centre, where there are usually the bosses which hold fast the handles, there are four lions or crocodiles in high relief curled up and in the centre was depicted mostly the sun with a human face. These were all executed with great spirit. The figures of sportsman pursuing the tiger, elephants and horse-riders, hunting scenes and a variety of birds and beasts are represented in the interstices of the Persian scroll work which is raised and gilded.

Enamelling :

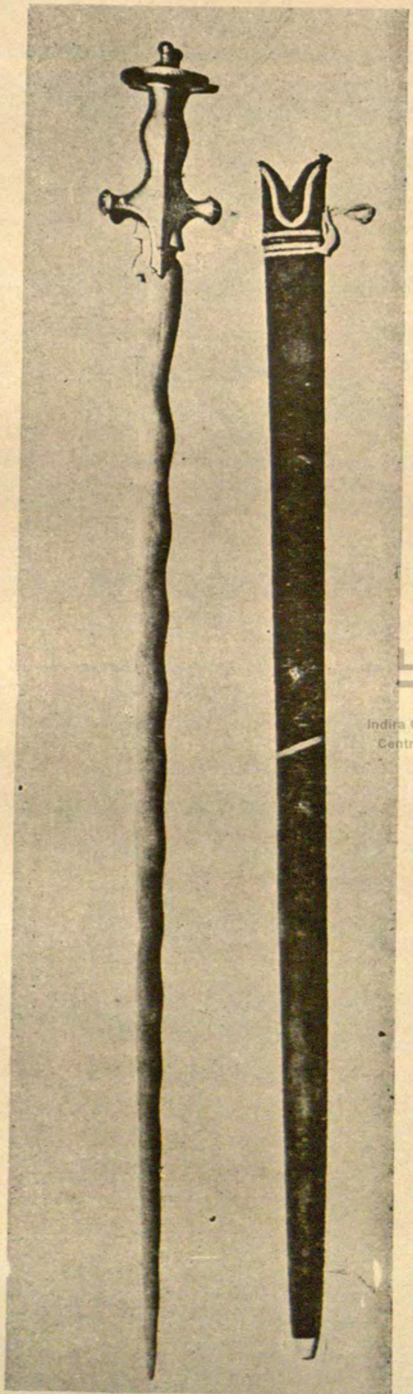
It was the speciality of Indian artist. At Delhi, Jaipur and Sirohi it was most successfully practised. Enamelling is painting on metals, with mineral oxides in such a manner that colours get firmly fixed. This is a time consuming process. In this process the *chitera* prepares the design, the 'goldsmith' (*Sunar*) makes the article to be enamelled, the 'engraver' engraves the pattern and the *Minakar* applies the colour. The object is then polished, gently heated and cleansed by rapidly immersing in a strong acid solution made from fruit.

Studding :

The use of jewels in the ornamentation of arms is peculiar to India. Precious stones like diamonds, rubies, emeralds besides pearls and semi-precious stones were used to enhance the beauty, brilliance and richness of the weapons. In the National

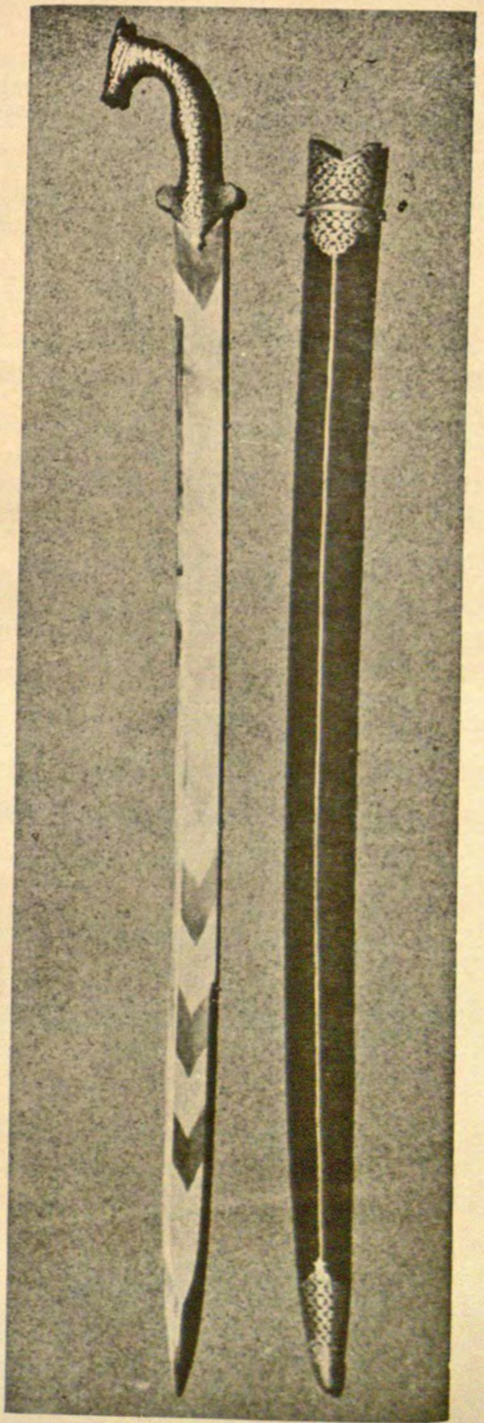
Plate XXVII

Fig 1.



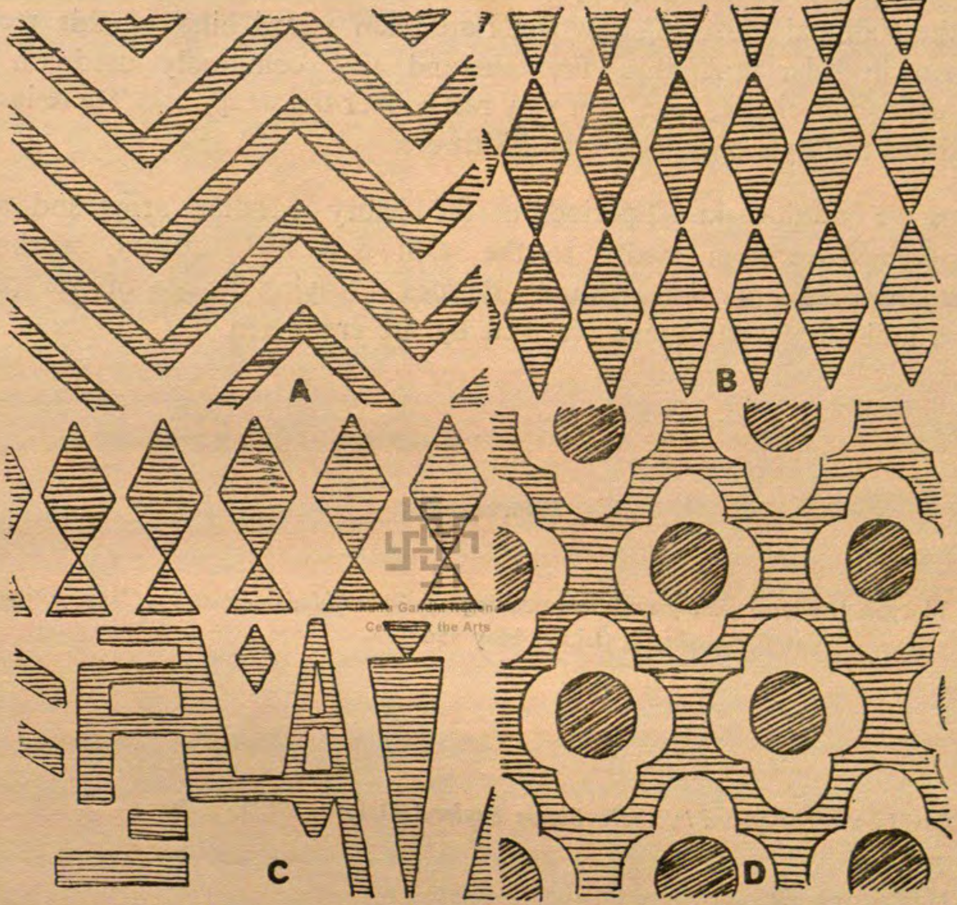
SAKELA BLADE,
RAJASTHAN, LATE 17th Cent, A.D.

Fig 2.



'KIRK NARDUBAN'
JAIPUR, C. 1750 A.D.

(Collection : National Museum, New Delhi.)



Examples of patterns worked in *Ganga-Jamni* type of mail

A Aventail of a helmet, brass and iron, Lahore
B Shirt and trousers, brass and iron, Lahore
C Aventail of a helmet, brass and iron, Hyderabad
D Shirt and trousers, brass copper and iron, Lahore

(after Russel Robinson)

Museum, New Delhi are several shields with emerald bosses, hilts studded with diamonds, elephant shaped handle where rubies are fixed in the eyes and so on.

Bidri technique :

In the National Museum, New Delhi are a few sword hilts of this technique. This originated in Bidar in Andhra Pradesh and was commonly used on bowls, ornaments, spittoons, chairs, etc. but very rarely over the weapons, There is a shield which illustrates the style of much of the Bidriware.

Thus we find that in all periods of the history of Indian arms and armours decorations formed on them testify to the skill and high quality, workmanship and the aesthetic sense of the artisans Besides satisfying the ego of the possesser it would also indicate the patronage received by the craftsmen.

References

1. Herbert Maryon '*Pattern-welding and Damascening of Sword-blades—Part 2*' *Conservation*, Vol. 5, Number 2, (I.I.C., May 1960).
2. *Ibid.*
3. *Ibid.*
4. *Ibid.*
5. *Ibid.*
6. H.R.E. Davidson : *The Sword in Anglo-Saxon England* (Oxford, 1962), p. 20.
7. *Ibid.*, p. 21.
8. Herbert Maryon: *op. cit.*
9. G. Baldwin Brown: *Arts in Early England*, Vol. III (London, 1903-37) p. 21.

For further study

1. W.G, Archer: *Indian Miniatures* (Greenwich, 1960).
2. Arnold and Binyon: *Court Paintings of the Grand Moguls* (Oxford, 1921).
3. Barrett and Gray: *Painting of India*, Skira 1963,.
4. Percy Brown: *Indian Painting under the Mughals.*
5. A.K. Coomaraswamy: *Mughal Painting* (Boston, 1930)
6. Basil Gray: *The Art of India and* Pakistan (London, 1950).

Plate XXVIII

Fig. 1

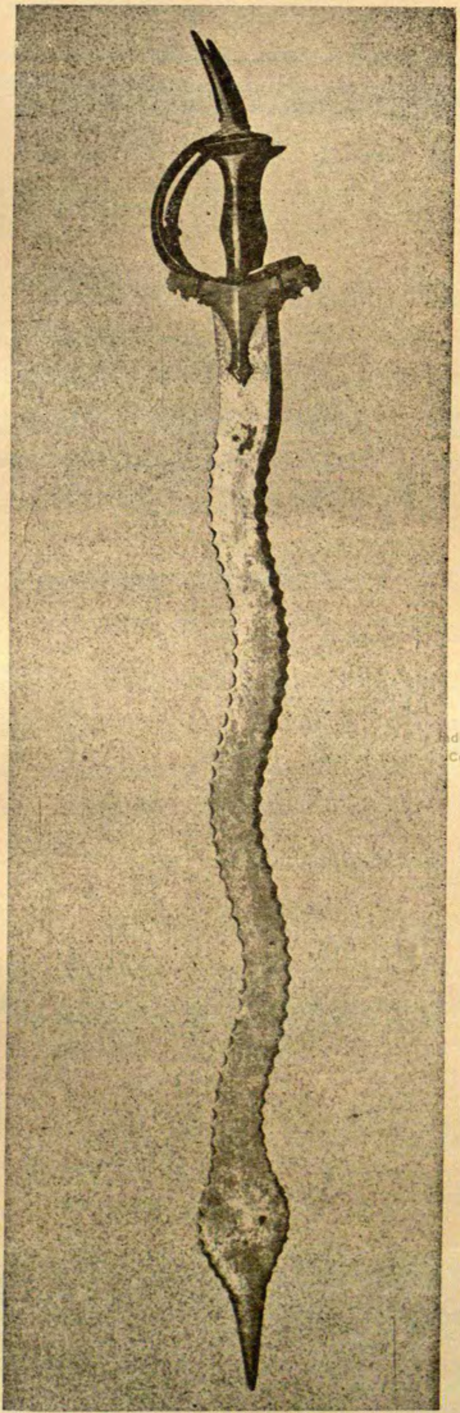
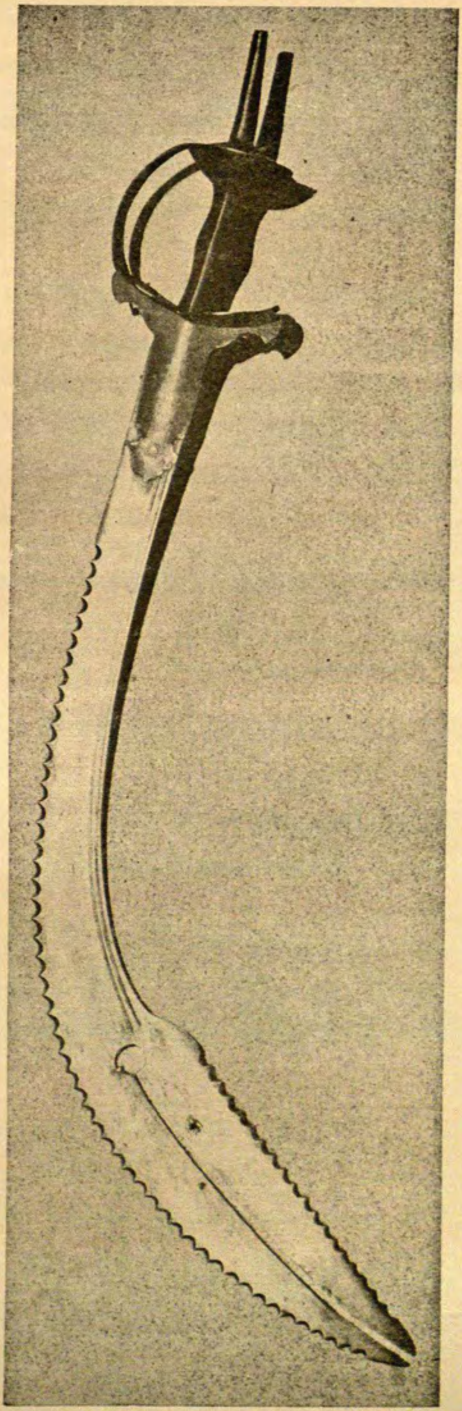


Fig. 2



SERPENTINE SWORDS
Northern India, Pahari School,
EARLY 16th. Cent. A.D.

(Collection : National Museum, New Delhi.)

7. T.H. Hendley:	*Memorials of the Jaypore Fxhibition*, Vol. IV (London, 1884).
8. John Irvine:	*Textiles and the Minor Art* (London, 1950).
9. S.C. Welch:	*The Art of Mughal India* (New York, 1963).
10. B.W. Robinson	The Sword of Islam, *Apollo Annual* (1949), pp. 58-59.
11. W.H. Schoff	Eastern Iron trade of the Roman Empire, *Journal American Oriental Soc.*, XXXV, (1915), pp. 233 f.
12. H.C. Richardson	Iron Prehistoric and ancient, *American Journal of Archaeology*, (2nd Series) XXXVIII (193[illegible]), p. 580 f.
13. Egerton of Tatton	*Indian and Oriental Armour* (London, 1896) New Edition.
14. H.R. Robinson	*Oriental Armour*, Arms and Armour Series, (London, 1967).

ARMS AND ARMAMENTS IN KALIDASA'S WORKS

Kalidasa, the skilled master in romantic narration, scenic portrayal and psycho analysis of the human character, lacked the force, vigour and vitality in depicting war scenes. The description of battles by him please us but does not rouse our valourous sentiments. The war accounts of Bhavabhuti in '*Uttararamacharita*' and Narayana Bhatta in *Venisamhara* overwhelm us. In Kalidasa, similar vigour and vitality is absent. The reason has been rightly suggested by Sri S.A. Sabnis, "Possibly the *Vaidarbhi* style of his (Kalidasa's) expositions is not quite suited for the expression or forceful representation of the martial sentiment, as does the *Gaudhi* which is used by Bhavabhuti or Narayana Bhatta. The harsh high sounding effect of the latter style is in consonance with the spirit of warfare, havoc and destruction." Nevertheless, Kalidasa is a veritable source for military life of the Gupta period which is substantiated by coins, wall paintings, terracotta figurines, sculptures and other literary accounts of the period.

Archery :

A. Bow

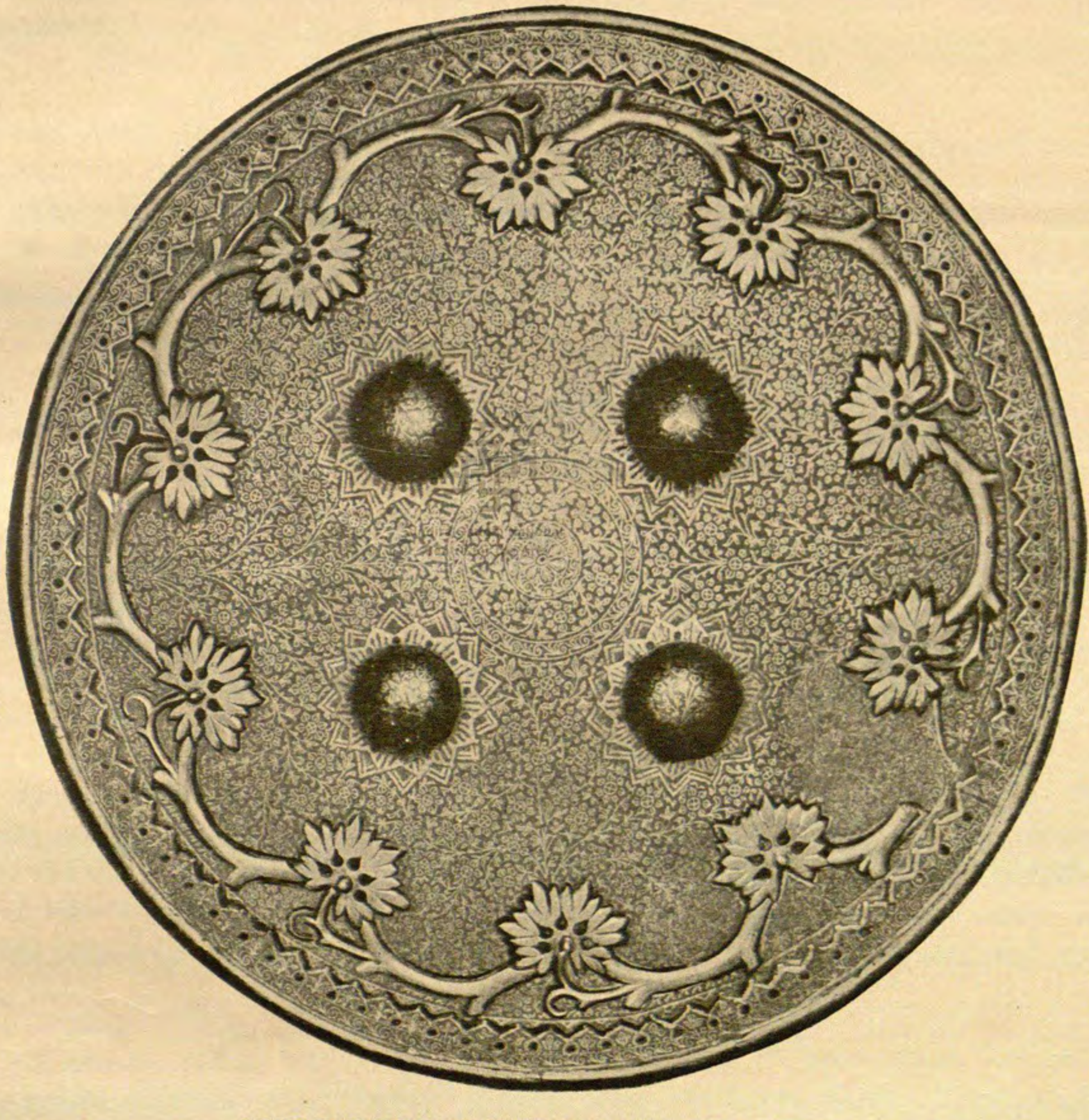
The importance of archery in ancient Indian warfare, its origin and development through the ages, etc. have been discussed separately. During Kalidasa's times bamboo (*rattam*), palmyra (*tal*), wood (*daru*), horn (*sringa*) and metal were used for the bow stave. The strings were made of *Murva* (a creeper), cotton threads, sinew or guts (*snayu*), hemp, etc. Bows were of various kinds, i.e. single curved, double curved or triple curved. As many as five curves have been noticed on the contemporary coins. Sometimes two separate pieces were hinged together with a straight, or curved metal grip. Rings were also fitted to the stave to beautify it. These have been exhaustively dealt with in the chapter 'Weapons on Ancient Indian Coins'. The Gupta warriors were skilled archers and wielded these with both hands. Sometimes these bows were so heavy that they required a number of men to move them :

"व्यादिदेश गणशोऽथ पार्श्वगान्कार्मुकाभिहरणाय मैथिलः"

(*Raghu*. XI, 43)

The common name for a bow was *Dhanu*. The various arrows discharged in battle by Manmatha's enemy drawing his bow (*Dhanu*) to his ear, cut all of a sudden into pieces the shafts of the enemy of gods:

Plate XXIX



SHIELD SHOWING PATTERN-WELDING WORK,
SOUTH INDIA, Early 17th Cent. A.D.

(Collection : National Museum, New Delhi.)

अपनीतशिरस्त्राणाः शेषास्तं शरणां ययुः ।
प्रणिपातप्रतीकारः संरम्भो हि महात्मनाम ॥

(*Raghu.* IV, 64)

When the heroes of Kumara and *Asura* began to fight with one another their bodies increased with joy of war and threat, their coats of mail dropped down from their person :

संग्रामानन्दवर्धिष्णौ विग्रहे पुलकाञ्चिते ।
आसीत्कवचविच्छेदो वीराणां मिलतां मिथः ॥

(*Kumar.* 16, 5)

The iron breast-plates were padded inside with cotton to prevent cutting the skin. When an armour was cleft asunder with sword-strokes, the cotton inside was let loose to mix with the surrounding atmosphere :

निर्दयं खङ्गभिन्नेभ्यः कवचेभ्यः समुत्थितैः ।
आसन्व्योमदिशस्तूलैः पलितैरिव पान्डुराः ॥

(*Kumar.* 16, 6)

Other weapons

Apart from the types mentioned above, Kalidasa has casually referred to many other weapons

Khsepani mentioned in the *Raghuvamsa* was a pellet bow, its modern counterpart being *Gulel.*

Bhindipala was a sling. It was made of ropes with a leather pocket in the centre for carrying stones. It was whirled round the head and when one end was let loose the stone was released. It is still used by the village farmers and aboriginal tribes for killing the birds. Raghu had a terrible fight with the mountain tribes, in which fire blazed up on the friction of the stones hurled by the *Khsepanis* and the arrows.

Chakra has always been associated with Vishnu and his incarnation Krishna. It was a round wheel-like object having four, six, eight or more spokes. Later on, it became the favourite weapon of the Akali sikhs. It has been referred to in the *Raghuvamsa* :

"अघोरणानां गजसंनिपाते शिरांसि चक्रैर्निशितै क्षुराग्रै:"

(*Raghu*. VII, 46)

Mace

Mace was a heavy and clumsy weapon used in hand to hand fight. The globular head was attached to a short metal rod. The head was either plain, petalled or studded with pointed iron spikes. It was most suitable for breaking the skull of the enemy. The wielding of *Gada* (mace or club) required a great skill and strength. In the *Mahabharata*, Bhima and Duryodhana have been portrayed as master mace-wielders. It is referred to in the *Raghuvamsa*. Another type was *Mugadara*. Its round handle was very small and the tapering lower portion was very heavy. It was rarely used in the battle but was commonly employed for physical exercise. This as well as *Laguda* (still another variant) finds mention in the *Raghuvamsa*. Regarding *Laguda*, says S.A. Sabnis, 'it was a kind of club, two cubits in length'. *Musala* was a pestle used for domestic use and for pounding corn.

Battleaxe, described in the *Raghuvamsa* was a crescent-shaped weapon. The blade was attached to the side of the shaft and was used for cutting.

Vajra was a mythical weapon generally associated with Indra who is known as *Vajrin*. When Raghu, with an arrow having its tip like the crescent-moon, cut off the string of Indra's bow, the latter, casting away his bow took up for the destruction of the very powerful army, a missile with a shining halo of light round it, accustomed to clipping the wings of the mountains :

स चापमुत्सृज्य विवृद्धमत्सरः प्रणाशनाय प्रबलस्य विद्विषः ।
महीध्रपक्षव्यपरोपणोचितं स्फुरत्प्रभामण्डलमस्त्रमाददे ॥

(*Raghu*. III, 60)

Surprisingly, several missiles mentioned by Kautilya such as *Sarvatobhadra*, *Jamadagnya*, *Mahasarayantra*, *Bahumukha*, and *Parjayanka* are not mentioned by Kalidasa. *Nalika* does occur which was a variety of cross-bow. *Sataghni* (literally, a killer of hundred persons) was a heavy movable weapon hurling stones. *Parigha* was a kind of battering ram. It consisted of a heavy wooden shaft studded with strong nails. It was used in siegecraft. It is recorded in the *Raghuvamsa* together with other weapons:

पादपाविद्धपरिघः शिलानिष्पिष्टमुग्दरः ।
अतिशस्त्रनखन्यासः शैलरुग्णमतंगजः ॥

(*Raghu*. XII, 73)

The Navy

A detailed description of ancient Indian navy has been given separately (see chapter on Indian Navy through the Ages). During the Gupta period the importance of a highly advanced navy was fully realised. Chandragupta II had extended his empire from sea to sea and it was essential for him to maintain a naval force to safeguard its frontiers from the pirates and the neighbouring rulers. Raghu crossed the Kapisa river with his troops that had formed a bridge of elephants and reached Kalinga. Boats and ships were employed by Raghu in his war against the ruler of Bengal :

बङ्गानुत्खाय तरसा नेता नौसधनौद्यतान् ।
निचखान जयस्तम्भान्गङ्गास्त्रोतोन्तरेषु सः ॥

(*Raghu.* IV, 36)

Scenes of the naval warfare depicted in the Cave-paintings of Ajanta also corroborate it.

The Army

The army was divided into four units, *i.e.* infantry, cavalry, elephant-corps and charioteers. Navy was still not recognised as an independent wing. The army of Raghu was called *Chaturangini* :

"…………ययौ पश्चाद्रथादीति चतुःस्कन्धेव सा चमूः

(*Raghu.* IV, 30)

With *Bheri*, *Tunya* and several other musical instruments the war was declared. Soldiers marched to the tune of war music. The King was recognised by his banner. When Raghu went to east with his banner all the enemies were terrified :

स ययौ प्रथमं प्राचीं तुल्यः प्राचीनबर्हिषा ।
अहितानिलोद्धूतैस्तर्जयन्निव केतुभिः ॥

(*Raghu.* IV, 28)

The soldier of one class generally fought with the soldier of the same class of the enemy, *i. e.* a cavalier challenged a cavalier and a charioteer, a charioteer :

पत्तिः पदातिं रथिनं रथेशस्तुरंगसादी तुरगाधिरुढ़म् ।
यन्ता गजस्याभ्यपतन्दजस्थं तुल्यप्रतिद्वन्द्वि बभूव युद्धम् ॥

(*Raghu.* VII, 37)

Fighting for the country was thought to be a noble ideal. The victorious ruled the earth and enjoyed the victory. The heroic dead in the war attained *Virasvarga.* There were certain standards and every soldier was expected to maintain them. Thus, the Brahmanas, the ladies, the children, the peasants and the innocent citizens were not to be harassed. The bards accompanied their masters and they were neither arrested nor killed by anyone. They were allowed free access everywhere :

युद्धाय धावतां धीरं वीराणामितरेतरम ।
वैतालिकाः कुलाधीशा नामान्यलमुदाहरन ।।

(*Kumar*. 16, 3)

Even amidst the fierce battle a wounded, sick, fallen and disabled or defenceless soldier was not killed:

पूर्वं प्रहर्ता न जघान भूयः प्रतिप्रहाराक्षममश्वसादी ।
तुरङ्गमस्कन्धनिषण्णदेहं प्रत्याश्वसन्तं रिपुमाचकाङ्क्ष ।।

(*Raghu*. VII, 47)

The soldiers exchanged hot words during the battle. A furious wordy war was fought between Kumara and Tarak and Indra and Raghu. The war came to an end in the evening and then the relatives of the dead soldiers were allowed to take the dead bodies for ceremonial purposes.

For Further Study

1. Ram Narayan Acharya, *Malavikagnimitram* (Delhi, 1966.)
2. Ram Narayan Acharya, *Raghuvamsa* (Bombay, 1948).
3. V.S. Agrawala, *Meghaduta - a study*. Rajkamal Prakasan (Delhi).
4. S.S. Chakladar, *Kalidasa, the National poet of India* (Baroda, 1964).
5. H.C. Chakladar, *The Geography of Kalidasa* (Calcutta, 1963).
6. Sitaram Chaturvedi, *Kalidasa Granthavali* (Kasi, 1954).
7. Abhinna Chandra Das, *Ritusamhara of Kalidasa* (1958, Varanasi).
8. C.R. Devadhar, *Malavikagnimitra* (Delhi, 1906).
9. C.R. Devadhar, *Vikramorvasiyam* (Delhi, 1968).
10. C.R. Devadhar, *Dramas of Kalidasa* (Delhi, 1966).
11. Ramanath Jha, *Abhijnana-Shakuntalam* (Darbhanga, 1957).
12. M.A. Karandikar, *Raghuvamsa of Kalidasa* (Bombay, 1953.
13. R.D. Karmarkar, *Abhijnana-Shakuntalma of Kalidasa* (Poona, 1962).
14. R.D. Karmarkar, *Kalidasa, extension lecture series-4* (Poona, 1952).
15. T.G. Mainkar, *Kalidasa ; his act and thought* (Poona, 1962).
16. J.T. Parikh, *Vikramorvarsiya of Kalidasa*, (Surat, 1947).
17. S.A. Sabnis, *Kalidasa, his style and his times* (Bombay, 1966).
18. Suryakanta, *Kalidasa's vision of Kumarasambhava* (Delhi, 1963).
19. H.H. Wilson, *Kumarasambhavam* (Varanasi, 1966).
20. H.H. Wilson, *Ritusamhara* (Varanasi, 1966).

MUGHAL ARMS

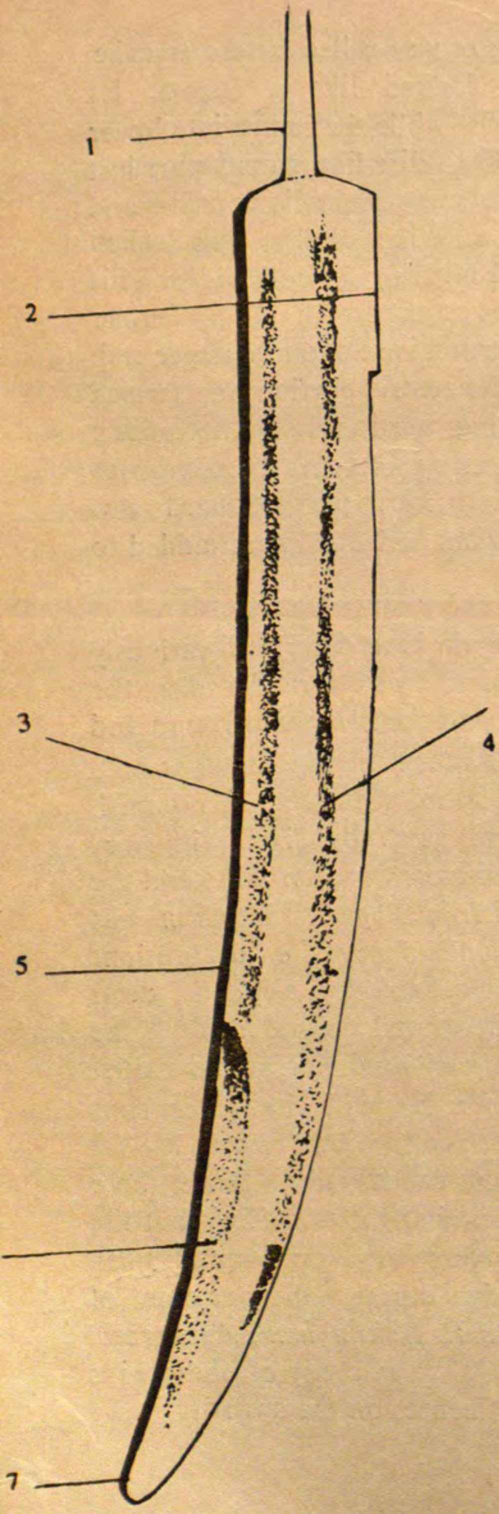
The Mughals have rightly been credited with several innovations in the Indian mode of fighting. Following the Central Asian nomads, the Mughals relied more upon their stirruped cavalry than on the war-elephants. This created a revolution in the military strategy. The horses were, no doubt, employed by the Indians in the battle but in the absence of stirrups the warriors found it most difficult to manage them in the course of fighting. It was mainly useful for drawing a chariot in war, transporting the warrior or fighting small battles. With the use of stirrups, the situation completely changed and the rider could now with his feet firmly in the stirrup, stand up and shoot arrows, hurl lances or fire matchlocks "It was the mastery of the horse facilitated by the use of the stirrup that enabled the Turks of Central Asia in the 12th century to conquer India. The heroism of the individual Rajput warriors and the training of war-elephants were of no avail before the rapid manoeuvres and impetuous charges of the Turkish horsemen."[1] With the Mughals a new factor, *i.e.* artillery, entered the scene. Though the mechanical artillery and gun-powder were known to Indians but it was Babar who effectively used the cannons in the battles of Panipat and Khanwa. Later on, full-fledged *Topkhana* was established. Navy also received new impetus under the Mughals. Efforts were also made to maintain orderliness and cohesion. Rules were prescribed for entering the services, regular drill, marches, camps, etc. The chariots and the outdated Indian weapons were abandoned and only those were retained which could fit in with either the then warfare or for the pomp and show of the Court. The Mughal weapons are classified and described in the following pages.

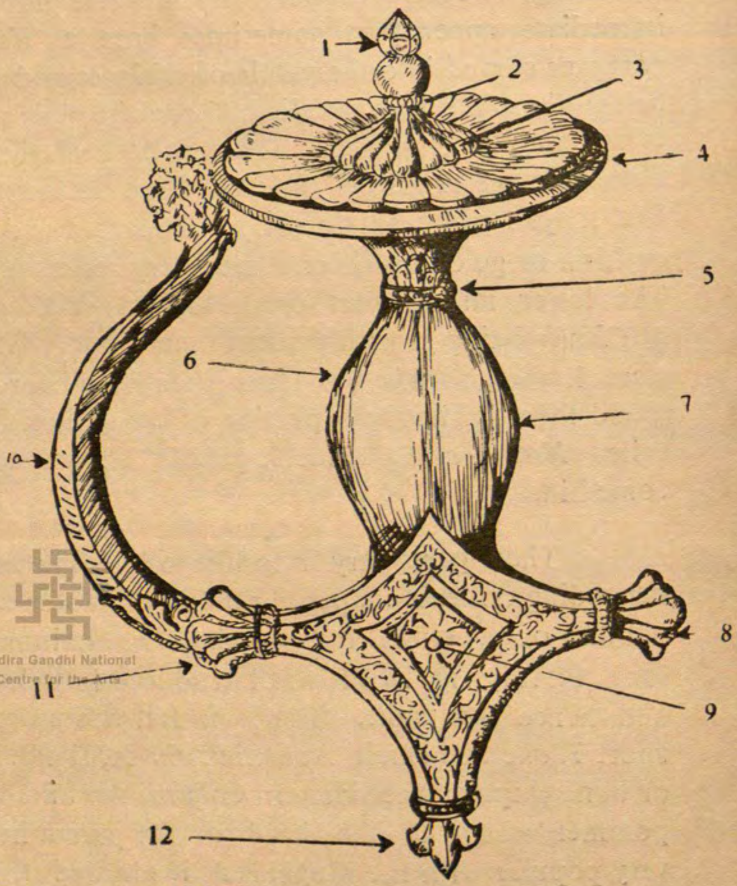
Sword

The sword still held its field. Different parts of the sword were *Tegha* (blade), *Nabah* (furrows on blade), *Qabzah* (hilt), *Mian* (scabbard), *Muhnal* (upper fitting of the scabbard), *Samal* (middle fitting of the scabbard), *Kamarsal* (the belt tied round the waist), *Bandtar* or *Hamail* (the leather strap with which the sword was hung). The temper of the blade was *Ab.*[2]

The hilts were further divided into *Mogra* (mallet) which was the uppermost part of the hilt, shaped liked a bud. At times, a hole is found in the mallet through which a silk thread or a piece of leather was attached so that the sword may not slip while being used. This thread was called *Dasti* and was wrapped round the wrist while wielding the sword. The part next to *Mogra* was called *Batasa* (a cake-like thing) or *Phool* (flower) as it was globular and looked like a *Batasa*. Its immediate upper part sometimes bore a *Kangan* (curls) while the immediate lower part was carved into the petals of a blossomed flower. The disc-like round part just below the *Batasa* was called *Katori* (bowl or pommel). It was generally concave and ornamented or engraved. The part between the pommel and the quillon was called *Putala* (image or grip). It was thick in the middle and tapering on both sides. This oval-shaped grip was profusely ornamented and sometimes covered with cloth, leather cushion or gold and silver wires. Very often a second cordon is seen on its upper end. The lower middle part of the hilt was called quillon. Its central portion was termed as *Chowk*, being generally square and flat. The projecting portions of the quillon were known as *Tholie*. These were both short and long and sometimes bore grooves round them. The lower portion of the quillon which fitted into the scabbard was called *Nakhkhas*. Knuckle-guards known as *Paraj*, *Odha* and *Bini* were added to some hilts.

These parts vary from hilt to hilt. The hilts have again been described variously depending on their shapes, *viz*., *Arabi* hilt where the pommel was straight like the handle of a stick, the grip flat, *Tholies* long and bent and the *Nakhkhas* round and long (Pl. XI, fig. 1). It was introduced in India by the Arabs sometime in 1000 A.D. and hence this name. The *Irani* hilt was a prototype of *Arabi* with curved pommel, short *Tholie* and small *Nakhkhas* (Pl. X, fig.3). These are generally fixed with ivory or bone chips on the sides. In Gujarat the hilts were copied from the *Irani* hilts and the pommel was like the head of the parrot hence called *Irani Popat*. The *Irani* was very popular with the Mughals as it allowed the craftsman's fancy for decoration. In the 16th century, several forms of other animals like horse, ram, dog, elephant, deer, hare, etc., were adopted for the hilts. In Rajasthan, the decorated animal heads of the hilts protected the fingers. *Delhi Shahi* (also *Gilota*) hilt consisted of a round mallet (with or without hole), flat, small and circular pommel; like a disc with its outer rims a little protruding, oval-shaped grip tapering on both ends and short *Tholies* with small tops (Pl XI., fig. 2). These were made of damascened steel. Since these were popular in Delhi, hence this name. *Shahjahani* was similar to *Delhi Shahi* but the pommel was slightly bigger and generally there was a cordon with ornamental lines on it. Some modifications on *Delhi Shahi* were made during the regime of *Shahjahan* and hence this name. *Jodhpuri*, *Udaipuri*, *Bikaneri*, *Hakimkhani*, *Aurangzebi* are several other hilts with minor differences in their details. The study of these hilts is very important for tracing the date, region and other influences on the sword





Parts of the Sword-Blade

1. *Dumala* (tang)
2. *Khajana* or *Tegha* (blade)
3. *Nal* or *Nabhah* (furrows on blade)
4. *Mang* (ribs)
5. *Peta* (edge)
6. *Pipala* (curvature)

7. *Tonk* (point)

Parts of the Hilt

1. *Mogra* (mallet)
2. *Kangan* (cordon)
3. *Batasha* (sugar-cake)
4. *Katori* (bowl or pommel)
5. *Kanthi* (necklace)
6. *Putala* (oval shaped image or grip)
7. *Janeo* (sacred thread)

8, 11. *Tholies* (quillon)

9. *Chowk* (base)
10. *Paraj* (Knuckle-guard)
12. *Nareh* (point)

(after Raj Raṭna Manikrao)

Every possible material, i.e. wood, bone, ivory (Pl. XXXV), precious and semi-precious stones (Pl. XXVI, fig. 2), metal, etc., was used in the decoration of these hilts. Innumerable designs and shapes are avilable all over India. It was on these hilts that pattern welding, enamelling, etc., were successfully employed.

Mughal swords were both straight and curved and also single-edged, double-edged or both, i.e. single-edged at the begining but double-edged towards the lower end. *Shamsher* was a curved sword commonly known as 'oriental sword'. It was purely used for cutting Its grip was small and the edge was on the convex side. *Dhup* was about 4 to 5 feet long, double-edged straight sword copied from the Deccan Sultans. This was considered an emblem of sovereignty and high dignity. Most of the Mughal and Deccan kings, princes and warriors have been portrayed holding this type of sword in the miniature paintings. It was also presented as an emblem of distinction upon successful soldiers, great nobles and court favourites.

The serrated swords were of two types, with sharp edge but saw-like back called *Arapusta* and the other with serrated edge on both sides known as *Aradam* (Pl. XXVIII, fig. 1). We also come across bifurcated serrated swords termed as *Julfkar* (Pl. XXVIII, fig. 2). The curved edges were called *Tareasapala* and the middle portion *Dora.* In one example, the blade contains several holes and small steel balls are fixed in such a way that each ball can be rotated. Such swords were called *Moti Daudati.* The swords were generally called *Sakela* (Pl. XXVII, fig. 1). Their blades were made of iron mixed with some other metal and there was so much of elasticity that it could be bent like the stave of a bow. The swords bearing a crescent-shaped hilt like that of *Jafar Takiya* was known as *Kukadidar. Tegha* was a curved sword having *Shahjahani* or other type of broad hilt and broad blade. Its another type was *Gaddara* which was shaped like the *Tegha* but abruptly became more broad and curved from *Kauri* (point on the blade).

The sword blades are either plain (*Halabbi)* or bear ribs (*Mang)* and hollows (*Nals*). Those bearing three ribs were called *Tajushahi*, two ribs *Sultan-Shahi* and with one rib and two hollows *Alemani*.

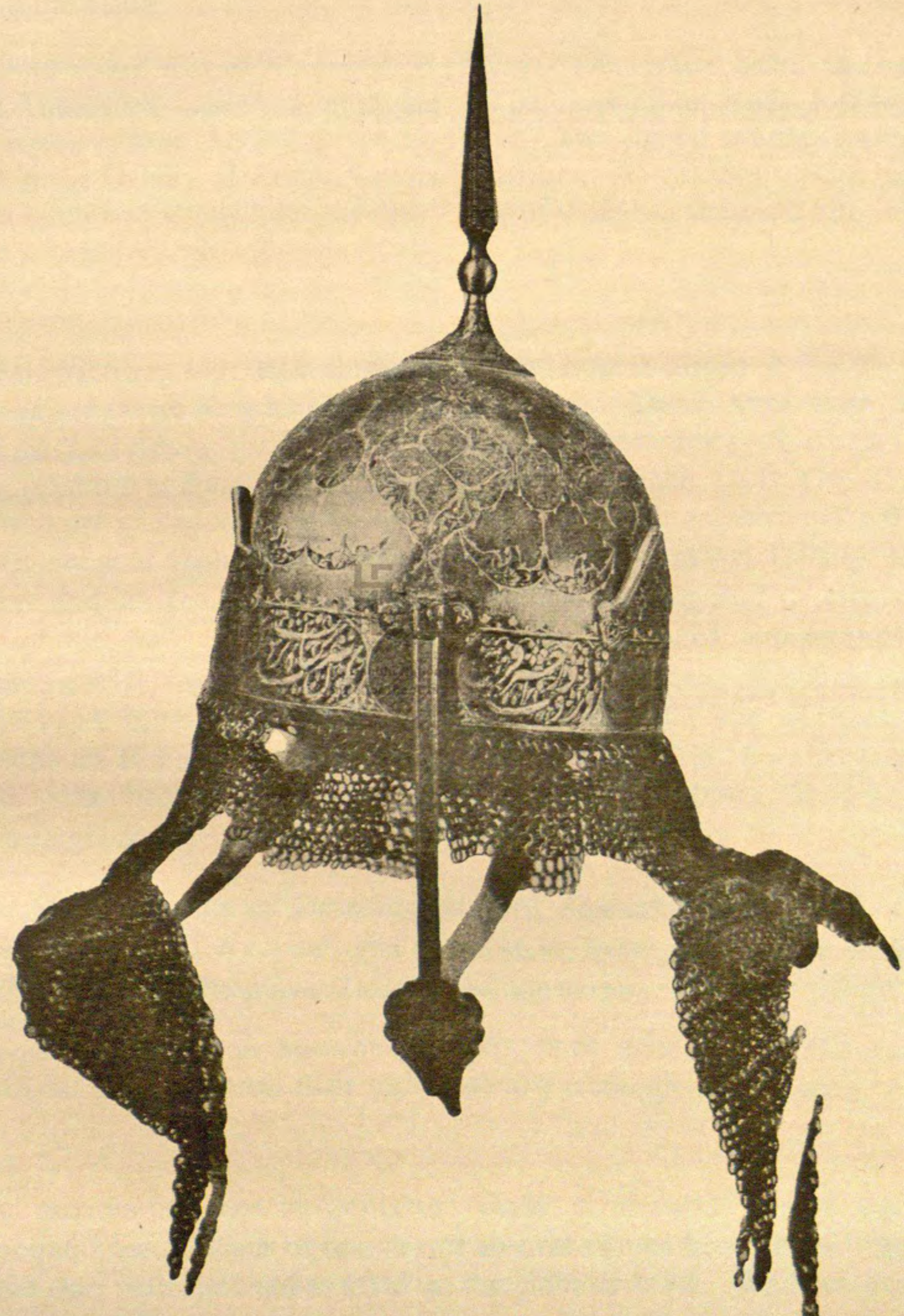
The scabbards were made of wood and covered with velvet (Pl. XI, fig. 1). Those covered with leather were painted and varnished. A beautiful scabbard in the National Museum is of this type. Floral designs have been painted on a black surface. Sometimes, wood was also lacquered. Ivory sheaths were not unknown. Sheaths of metal were generally engraved. The scabbards contained hooks or rings through which the leather belt was inserted and then it was either hung round the arms or slipped into the waist-belt (Pl. XIII). It was also carried over the shoulders. In some sheaths locking arrangement was also made with spring-locks so that the scabbard might not slip.

The sword of Jahangir in the National Museum, New Delhi bears the inscription '*Shah Jahangir Padshah Gazi*" and is dated 1027 A H. (1608 A.D.). The name of the manufacturer "*Abdul Rahim Mushahadi*" is also given. A verse "*Nasarun Milla ha Fatahun Karib*" is engraved for the victory of the emperor. The wooden scabbard is covered with velvet of light blue colour. This sword belongs to the State Museum, Hyderabad.

In a painting executed under the direction of Muhammad Faqirullah Khan, head artist of the court of Shah Jahan in 1650 A.D, Akbar has been portrayed holding a double-edged straight sword. The hilt is studded with jewels and the scabbard decorated all over with floral design. A similar sword with a more exquisitely painted scabbard can be seen in the hand of a nobleman painted by Mir Hashim of Mughal court in 1650 A.D. This painting is in the collection of M. Demotle, Paris.

Three inscribed swords were acquired from the curio dealers for the Archaeological Museum, Red Fort, Delhi[4]. The first one is of Ali Mardan Khan. It is a curve bladed scimitar with excellent *Jauhar* (watered steel) and inlaid with gold. It measures 2 feet and 8 inches in length and 1¼ inch in breadh. The hilt has an ivory grip with a gold plated cross-guard, enamelled and a ram-shaped pommel The wooden scabbard is covered with red velvet and furnished with gold mounting and two sling-rings. It bears the inscription "*O Ali, the exalted Wazir ul-mulk Nawab Saadat Ali Khan Bahadur 1214 A.H.*" (A.D. 1799-1800). It is clear from the inscription that the sword was originally presented to Saadat Ali Khan by Shah Abbas Safri, the king of Persia (A.D. 1587-1629) after he was appointed the governor of Kandhar in 1031 A.H. But during the reign of Shah Safi (A.D. 1629-42) he fled to India and took refuge with Shah Jahan. Later on, the sword came in the possession of Saadat Ali Khan, the Nawab of Avadh (A.D. 1748-1814) who inscribed his name on the blade.

The second is the sword of Shah Jahan, measuring 2 feet 8 inches in length and only one inch in width. It is slightly curved. The hilt with a cross-guard and circular pommel is inscribed with the ninety nine attributes of God. The Persian inscription in *nastaliq* script, inlaid with gold records that "*there is no God but Allah and Muhammad is Prophet. The sword is of second Sahib quiran (Lord of the happy constellation), the king*



INSCRIBED HELMET,
MUGHAL, C. 1750 A.D.

(Collection : National Museum, New Delhi.)

champion of faith, the emperor of sea and named Shah Jahan ...." The name of the sword is given as *Nusrat Baksh.* It also bears a small engraving of an umbrella upon the blade.

The third sword that of Aurangzeb is curved. The blade bears the name of God, Ali and Aurangzeb under an umbrella. The inscription reads "*Alamgir, the emperor, Champion of faith, 1112 A.H.*" (A.D. 1700-1). Two curved swords of Aurangzeb are displayed in the Gallery of Arms, National Museum, New Delhi Both bear the name of Aurangzeb and are without sheaths. One of them has the *Irani* hilt of ivory and the blade is engraved with *Quranic* verses.

Bows and Arrows

The Mughal bows were both single-curved and double-curved and in the second variety two separate pieces were hinged with a metal grip. These were four to five feet long and made of wood, bamboo, horn, steel and sometimes of ivory. In the Zarkoe Sole Collection at Russia two bows of Bahadur Shah (A.D. 1708-1712) are included. These are of metal, bear verses in his honour and are covered with rich gold work. One bow of Shah Jahan is preserved in the Dogra Art Gallery, Jammu. It is of metal and at the notches bears an inscription. Egerton describes, 'The concave side of the bow (the convex when strung) was lined with several strings of thick catgut to give it elasticity and force. The belly is made of buffalo or wild goat's horn, jet black and of a fine polish, glued to this is a thin slip of hard, tough wood. The ends are fashioned to represent snake's heads. The horn is left plain, while the wooden back is decorated with arabesques of birds, flowers or fruit intermingled with gilding."[6]

The archer was known as *Tirandaz*, the stave, *Kaman*, the string, *Zih*, *Chillah* or *Roda*, the grip, *Mootha*, the curved sides of the stave, *Sufar*, the notches *Goshah*, the finger-stall *Zihgir* or *Shast*, the quiver *Tarkash* and the arrow, *Tir*.

Different types of arrows, bows and quivers have already been discussed and so also the material used for them, their technique and methods of operation.[7]

Mace[8]

Several varieties of maces are available. *Gada* consisted of a small steel rod with a single round head, *Shaspar* or lung-tearer an oval-shaped head, *Piyazi* like that of an onion and *Gurj* with steel spikes fitted on the globular head. We have examples of *Gurj* having double head, one above the other. It was generally 3 to 4 feet long with head three inches in diameter. Sometimes, an octagonal steel shaft is attached on the top. This variety was called *Dhara* and those having eight bladed heads with basket hilts were known as *Garguj.* In the National Museum is preserved an example where the blade of a battle-axe is attached just below the head and the hilt bears a knuckle-guard with a long rod type mallet. In Timur's time we hear of mace-bearers riding on horses with golden saddles. Abul Fazl states that the price of a *Gurj* ranged from ¼ rupee to 5 *muhars.* Shah Jahan had bestowed one mace of gold on Haji Beg.

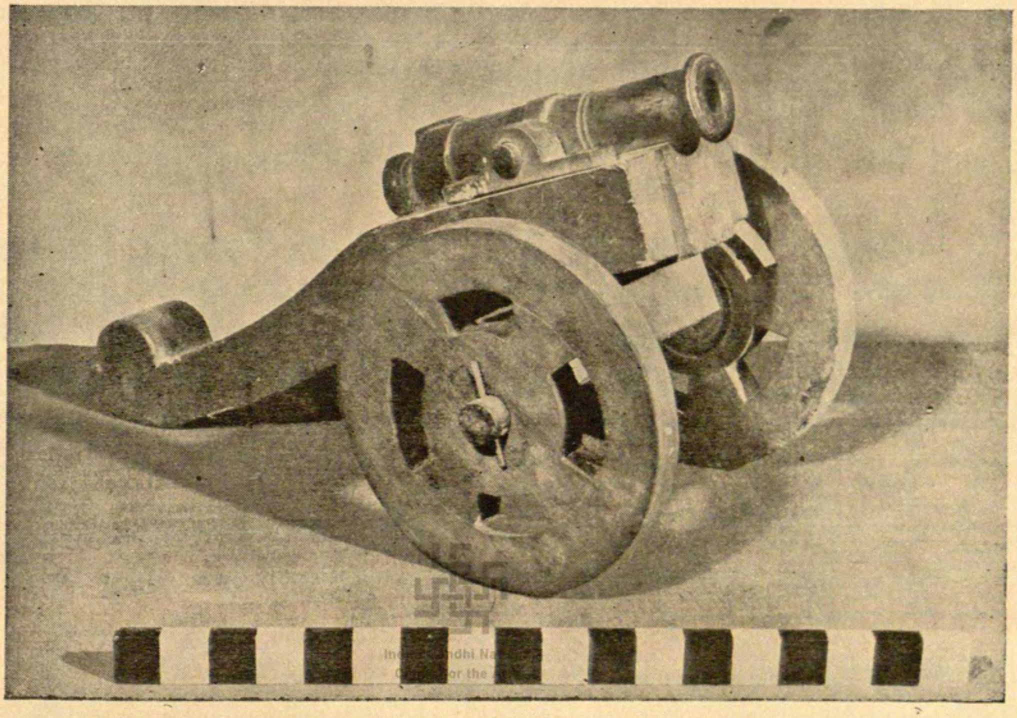
Tavernier presented to emperor Aurangzeb one battle mace of rock crystal, of which the sides were covered with rubies and emeralds and inlaid with gold. The handle of some maces concealed a dagger which could be used in times of need.

Battle-axe[9] (*Tabar*)

Battle-axe was not commonly used as a weapon of war. It has often been depicted on coins and in sculptures owing to its association with some mythical heroes like Parshuram, etc. During the Mughal period, however, it was preserved in the court as a curio and to enhance the beauty of the armoury. Many of its varities have been painted in the Mughal miniatures and in the illustrated manuscript of *Ain-i-Akbari* exhibited in the Prince of Wales Museum, Bombay. It was also called *Tabar.*

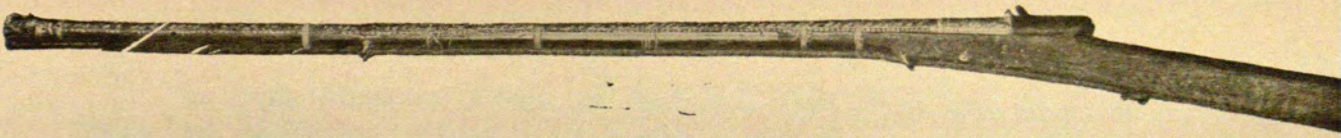
It consisted of a triangular blade with one broad cutting edge. Another variety was *Jaghnol* (crow's beak) in which the head was pointed and provided with two cutting edges. Sometimes, a battle-axe was combined with a *Jaghnol* and was called *Tabar Jaghnol.* It was double-headed, the broad blade on one side and the pointed blade on the other. *Tarangaleh* was an axe with a longer handle. The shaft of the battle-axe measured generally 3 to 4 feet, head of the axe 3 to 4 inches horizontally and 5 to 6 inches vertically. The shafts were beautifully decorated with gold and silver work. The battle-axe of Nadir Shah in the National Museum is a remarkable specimen. Its length is 20 4 inches, blade 5.4 inches x 3.6. inches. It is inscribed with *Quranic* verses and '*Sahibe Qiran Nadir*' in Arabic. The handle is profusely decorated with floral designs in gold and silver work.

Plate XXXIV



MOUNTED CANNON
C. 1780 A. D.

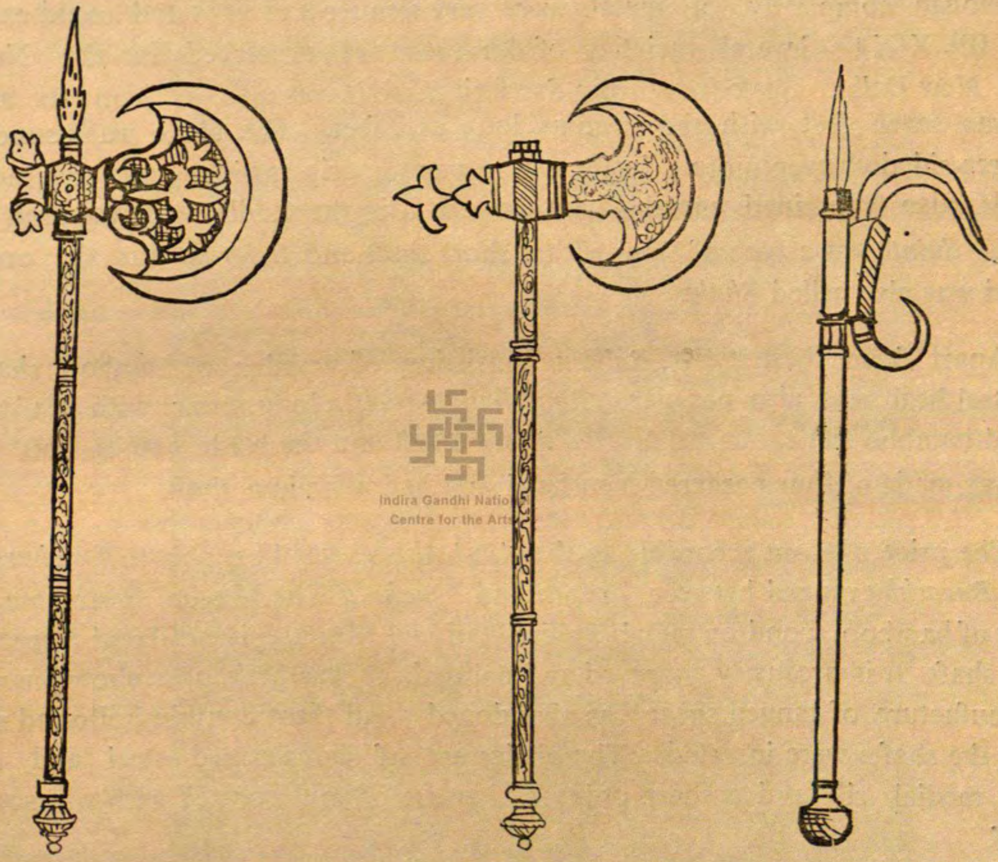
(Collection : National Museum, New Delhi.)



MUZZLE LOADING GUN WITH DAMASCENED BARREL,
MUGHAL, C. 1700 A. D.

(Collection : National Museum, New Delhi.)

Silver ornamented axes were carried by the attendants and displayed in the hall of audience. *Chamchaq* (also called *Chakhmagh*) was the battle-axe fastened to the saddle.



From L to R: Battleaxes, elephant—goad

Spears [10]

In *Zafar Nama* of Timur we find that Arab lances were prized by warriors. Timur had distributed several arms together with spears among the Muslims of

Ajmer. In the *Ain-i-Akbari* five kinds of spears have been mentioned. *Neza* was a cavalry lance having a small steel head in a long bamboo shaft (Pl. XVIII). It was 10 to 12 feet long, held in the middle, raised above the head at full length of arm and hurled. *Barachha* was wholly made of iron or steel. Egerton wrongly calls it a 'Maratha lance'. I do not agree with Irwine either, who doubts "this spear could hardly have been wielded by a man on horseback and was no doubt confined to infantry".[11] These pieces, though completely of metal, were very slender and light and could easily be thrown (Pl. XIX). Several varieties of *Barachha* are preserved in the National Museum, New Delhi. *Sank* (*sang* from Sanskrit *Shakti*) was also of iron. Its average length was seven feet with the head as long as 2 feet. The blade was round, two-sided, three-sided or even more. In the centre was the grip which was covered with velvet It also contained metal chain to fix it in the saddle. It was used by the cavaliers. *Sainti* was a type of *Sang* with a short shaft and *Selarah* was the ordinary spear and was also called *Bhala*.

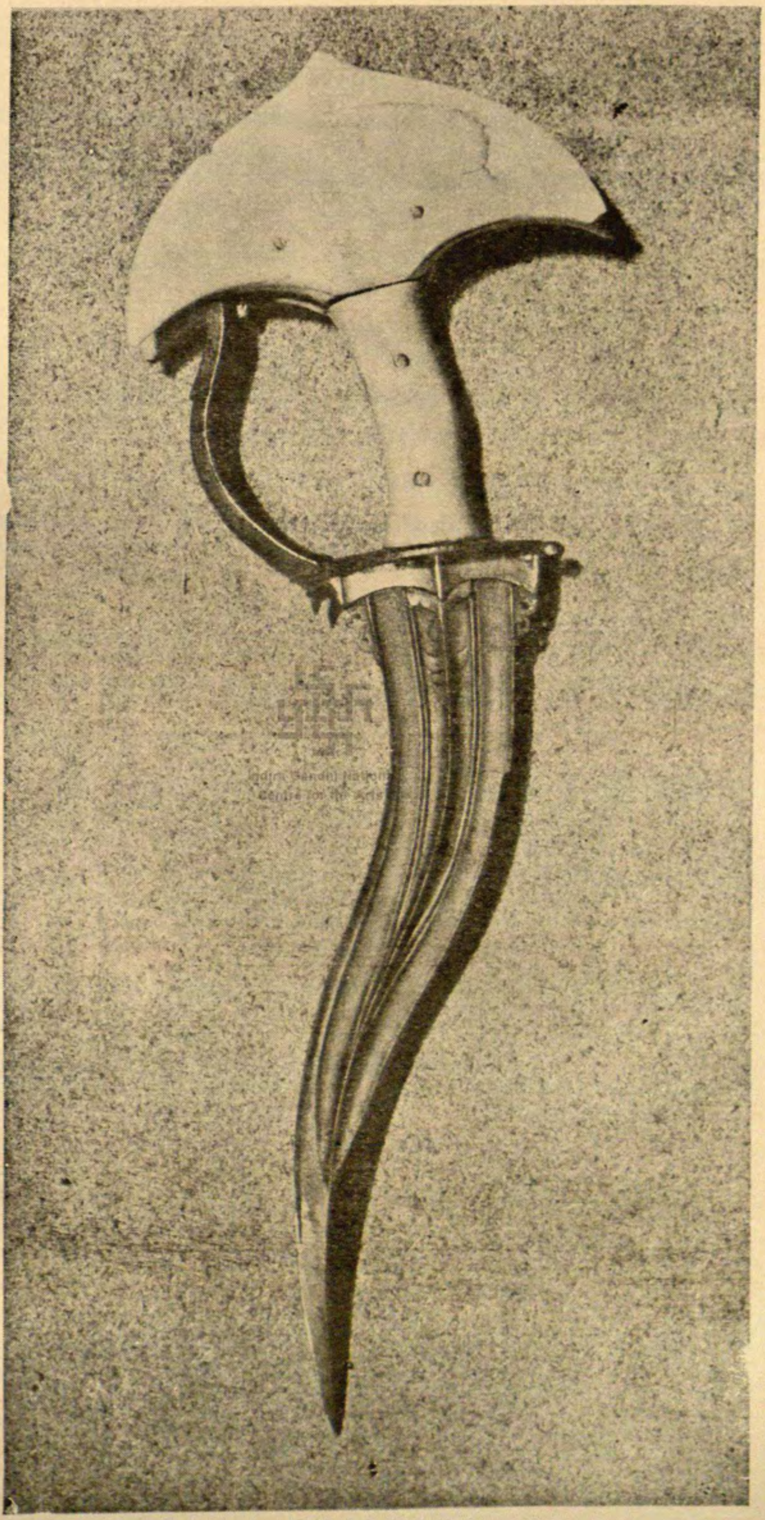
Apart from these types, *Ballam* consisting of wooden or bamboo shaft and barbed steel head was also popular. *Pindi-ballam* was a long spear with leaf-shaped blade and bamboo shaft. Its length was about 8 feet and the blade 2 to 2½ feet. *Lange* (lance) was made of four cornered iron head and had a hollow shaft.

The price of *Neza* according to the *Ain-i-Akbari* was 1¾ rupees to 6 *mohurs* while that of a *Barachha* ranged between ¾ rupee and 2 *mohurs*. The Mughal spears, etc., were generally of bamboo, wood or metal In the National Museum is exhibited a spear with an ivory shaft. It is profusely engraved and painted. It was perhaps a show-piece only. The manufacture of tanged spear was abandoned. All these contain hollowed shanks in which the shafts were inserted. The blades are of damascened steel and mostly carry a medial rib and a sharp point They are often decorated with war scenes in bas-relief.

Daggers and Knives

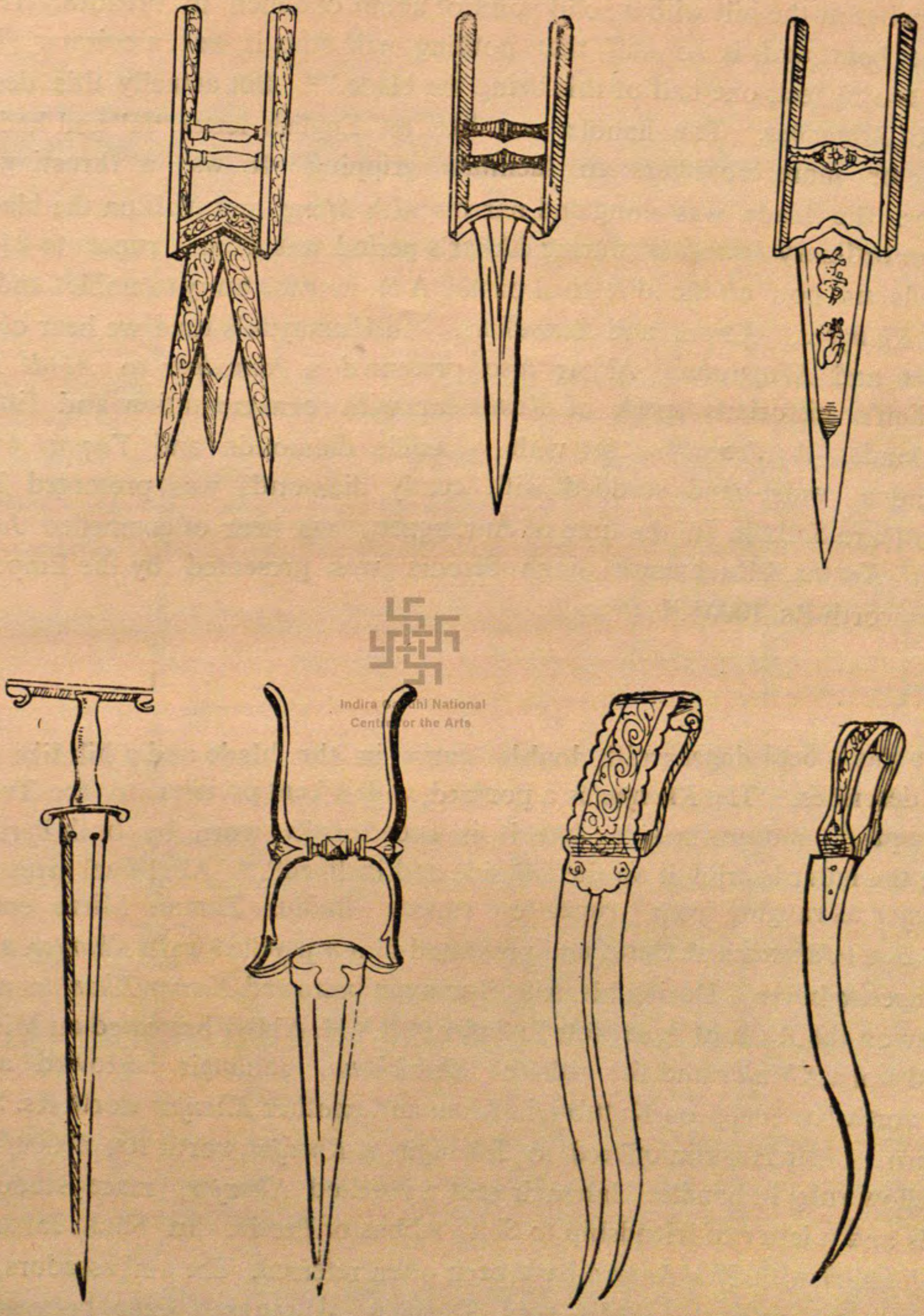
The *Ain-i-Akbari* includes several varieties of daggers and knives. The most popular was *Jamadhar* which had a beautiful handle and a broad straight blade. The translator of *Mustafa's Seir* describes a *Katar*, "A poignard peculiar to India made with a hilt, whose two branches extend along the arm so as to shelter the hand and part of the arm. The blade is very thick with two cutting edges, having a breadth

Plate XXXV



CURVED DAGGER WITH IVORY HANDLE,
MUGHAL, DELHI, C. 1750 A.D.

(Collection : National Museum, New Delhi.)



Jamadharas

of three inches at the hilt with a solid point of about one inch in breadth. The blade cannot be bent and is so stiff that nothing will stop it but a cuirass. The total length is 2 to 2½ feet, one half of this being the blade."[12] But actually this description applies to *Jamadhar.* The handle was like an English letter "H" and had at right angles one or more cross-bars to facilitate gripping. It was a thrusting dagger. Sometimes, the blade was long and narrow with *Mangs* and *Nals* on the blade. The price of an ordinary *Jamadhar* during Akbar's period was from ¼ rupee to 2½ *mohurs.* Babar tells us how on the Id festival of 932 A.H. he gave away to nobles and officers jewelled *Khanjars, Katars* and *Jamadhars.* In Humayun's time we hear of jewelled *Jamadhars* and *Khapwahs.* Akbar also presented a *Jamadhar* to *Abidi Khawaja.* Shah Jahan's historians speak of *Jamadhar* with ornamentation and fittings of various kinds. A *Jamadhar* set with valuable diamonds and *Yaqints* with *Phul Katara* and a waist-band studded with costly diamonds was presented by Shah Jahan to Dara Shikoh. In the time of Aurangzeb we hear of enamelled *Jamadhars* with *Phul Katara.* Raghunath Singh Sisodia was presented by the Emperor with *Jamadhar* worth Rs. 1000/-.[13]

Khanjar

It was a bent dagger with double curve in the blade and a hilt like a sword. Mustafa describes, 'The *Khanjar* is a poniard, with a bent peculiar to the Turks who carry it upright and on the side ; but it is occasionally worn by both Persians and Indians ; the latter bearing it on the left side and inclined".[14] Abul Fazl gives the price of a *Khanjar* as ranging from ½ rupee to 5 rupees. Badiuz Zaman Mirza entertained Babar in *Bag-i-Jahanara* at Herat and presented him a jewelled waist *Khanjar*, a *Charqab* and a *Tupchaq* horse. During his exile Humayun bestowed *Kamar Khanjars* and robes of honour on the Rana of Amarkot. In Safar 992 A.H. Akbar bestowed on Mirza Khan a jewelled waist *Khanjar* and the title of *Khankhana.* Jahangir bestowed a jewelled *Khanjar* worth Rs. 6000/- on Kutub-Din-Khan and another *Khanjar* worth Rs. 2000/- on Rana Karn. Mir Hussain offered to Jahangir a *Khanjar* worth Rs. 50000/- studded with a yellow ruby in handle. Jahangir sent a jewelled *Khanjar*, mace studded with diamonds and a letter of friendship to Shah Abbas of Persia. In Shah Jahan's time jewelled *Khanjar* with *Phul Katara* have been often referred. The ambassadors of Balkh and Persia were presented with gold *Khanjars.* Aurangzeb once bestowed upon Bakhtawar Khan a *Khanjar* with a crystal handle and fittings of enamelled gold.

1-2. Bows

3. *Kantha Shobha*

4. Shield

5. *Ghugwal*

6. *Udanah*

7. *Zirih*

8. *Bhanju*

9. *Tabar-Zaghnol*

10. *Shaspar*

11. *Bank*

12. *Tarangalah*

13. *Bhelhetah*

14. *Sosankatta*

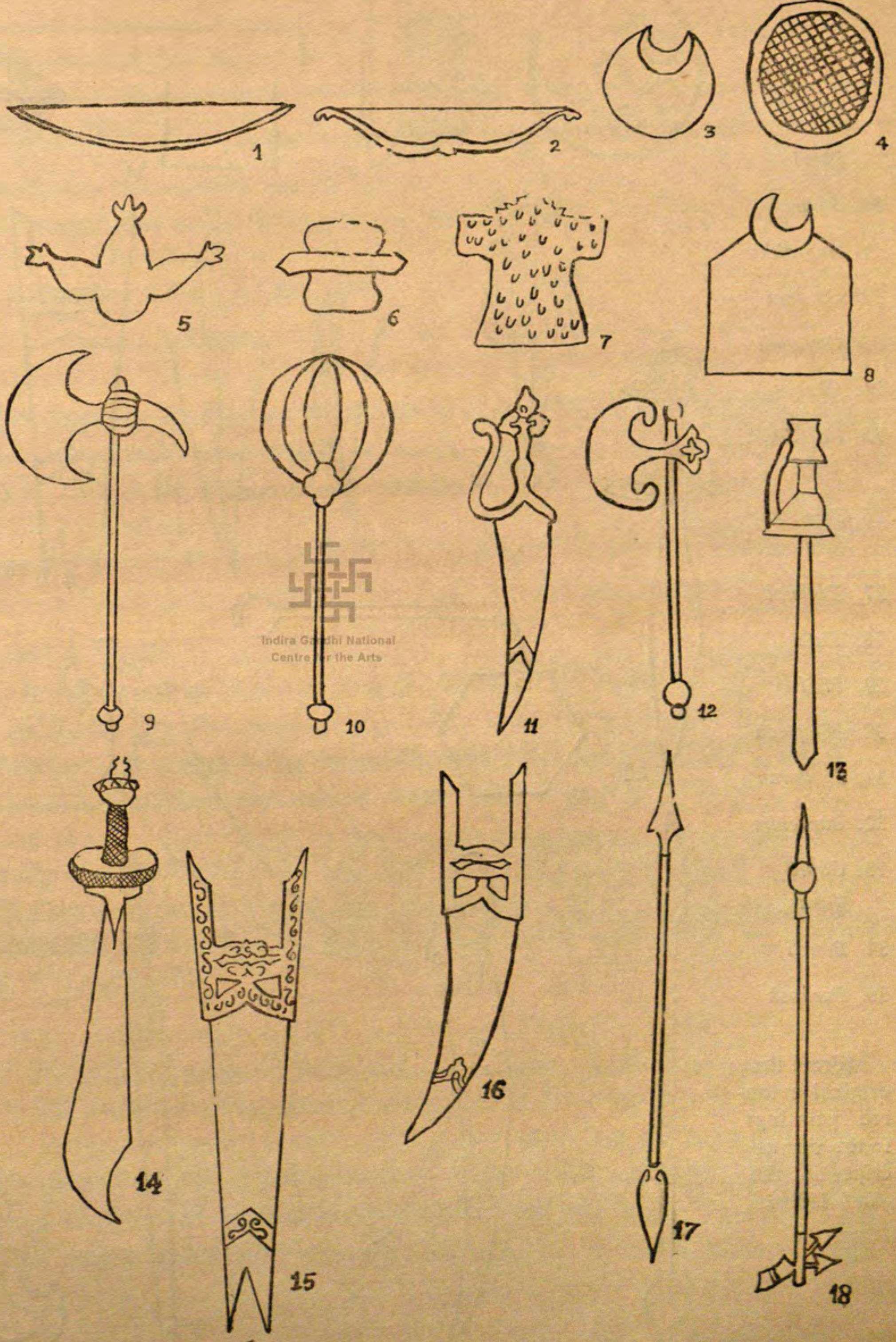
15. *Jamadhar-Daulikaneh*

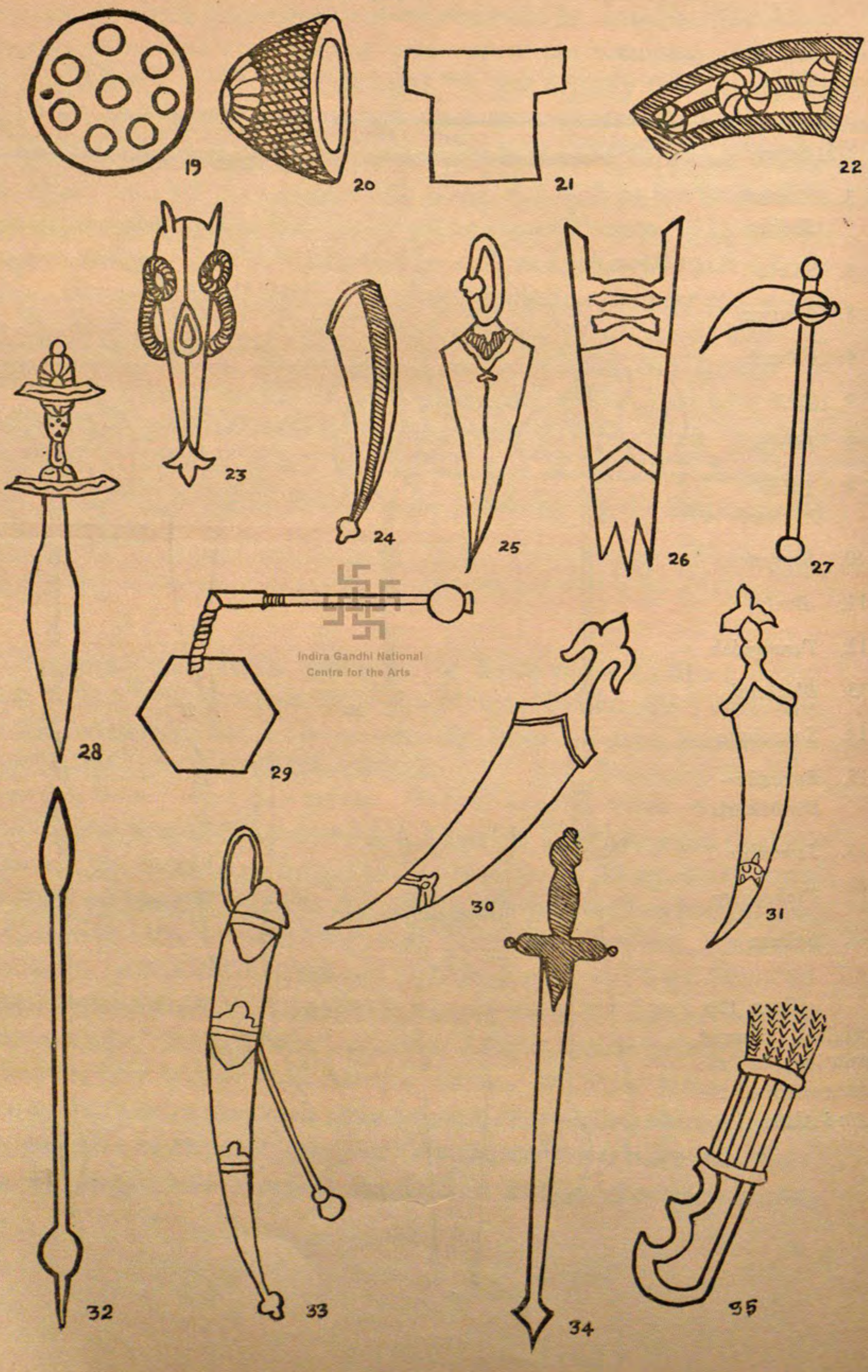
16. *Jamadhar*

17. *Tschehonta*

18. *Ballam*

(From the original coloured paintings in the manuscript of the *Ain-i-Akbari.*)





19. *Phari*

20. *Sipar*

21. *Angrakha*

22. *Gardani*

23. *Oashqah*

24. *Chaque*

25. *Nar-Singh Moth*

26. *Jamadhar Sehlicaneh*

27. *Zaghnol*

28. *Katar*

29. *Flail*

30. *Khapwah*

31. *Jambwah*

32. *Barachha*

33. *Gupti-Kard*

34. *Baneh*

35. *Tarkash*

(From the original coloured paintings in the manuscript of the *Ain-i-Akbari*).

Similarly, a jewelled *Khanjar* with jasper hilt and enamelled fittings was presented to Shaista Khan, the Governor of Bengal.[15]

Khapwa :

It was generally curved with simple handle. The price of a *Khapwa*, during the Mughal period ranged normally from ½ rupee to 1½ *mohurs.* Mahawat Khan once presented to Jahangir a jewelled *Khapwa* worth Rs. one lakh. In Shah Jahan's time it has been often referred to with *Phul Katara.*[16]

Jambwa :[17]

It was just opposite to *Khapwa* in curvature with similar hilt. Abul Fazl states that the usual price of a *Jambwa* varied between ½ rupee to one *mohur.* On the *Shab-i-barat* day in 1600 A.H., Prince Dara Shikoh was presented a *Jambwa* worth Rs. 80,000/- by the Mughal court.

Katara :

Its handle was similar to that of *Jamadhar.* The long, double-edged blade was mostly curved. Irvine describes it as a poignard peculiar to India. In the National Museum, New Delhi, are two *Kataras,* one concealed within the other. The larger blade is hollow and acts as a sheath for the smaller one, the side guards of which are hollow and conceal those of the outer *Katara.* The author has come across with a *Katar*a having five blades. These open on pressing together the bars of the hilt. The blade was generally of damascened steel and the hilt decorated with floral designs in gold or silver. The wooden sheath was mostly covered with velvet of dark colour and fitted with gold mounts.[18]

Kard :

Primarily, an Afghan weapon, it resembled a butcher's knife. Its total length was two or three feet and more than three-fourth of which was the blade. Its price ranged from two *dam* to one *mohur.* On the 8th October, 1720, Mir Haider Beg Dughlat killed Sayyad Hussain Ali Khan, the Mir Bakshi of the court, with a *kard* *Ain-i-Akbari* refers to a *Gupti-Kard* which was a knife concealed in a stick. *Qamchi Kard* was a whip fitted with a handle which served also as a sheath for a knife. *Budga*

*Kard (*or *Bugda Kard)* was a Central Asian knife bigger in size and with similar details. Shah Jahan had presented one *Kard Khanjar* to Adil Khan, the king of Bijapur. An *Uzbeg Kard* studded with jewels adorned Aurangzeb on the occasion of *Muharam* in 1708 A H. It was a common practice to present a *Kard* to the head cook.

Chaqu :

Chaqu was the name for the ordinary class-knife and *Saliabah-i-Qalmaqi* was the knife used by the people of Kashgar. "It was as long as a sword, had a handle made of fish bone called *Sher-Mahi* (lion-fish), and was slung from a shoulder belt."[19] *Bank* was another curved knife. Its price varied from half a rupee to one *mohur.*

Narsingh Moth :

It occurs in the *Ain-i-Akbari.* It was a variety of *Khapwah.* A dagger similar to it was *Jamkhak.*[20]

Walking Sticks :

These sticks were profusely decorated all over. In the National Museum is preserved a walking stick consisting of four weapons, viz., a pistol, a knife, a long pointed blade, and a powder cap. The stick of Bahadur Shah II dated 1257 A H. (1841 A D) is engraved with the Persian inscription which reads "He who has the stick has the buffalo" meaning "might is right." Aurangzeb used to carry a stick made of jasper.

Budga :

It was a cleaver used by cooks and butchers. Shah Jahan once bestowed on Abdullah a *budga* of enamelled gold, a robe of honour and 5000 rupees.

Armours :

Armour known as *Silah* was worn by the soldiers of all class. The persons of high rank and those who could afford it used costly, decorated and damascened armours. Irvine,[21] quoting a British Museum manuscript, has given a table showing the fines imposed upon the soldiers for not producing their armours at the time of inspection :

Rank of Officers	Amount of fine for non-production of				
	Head-piece	Body armour (*Baktar*)	Elephant armour (*Pakhar*)	Greaves (*Ranak*)	*Harhai*
	Rs. a. p	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
400	2 0 0	5 0 0	4 0 0	2 0 0	1 0 0
350	2 0 0	4 0 0	3 12 0	1 12 0	0 15 0
300	1 12 0	4 0 0	3 8 0	1 8 0	0 14 0
250	1 8 0	3 8 0	3 4 0	1 4 0	0 13 0
200	1 0 0	3 0 0	3 0 0	1 0 0	0 12 0

William Egerton explains how it should be worn. Depending from the cuirass was generally a skirt, which was at times of velvet embroidered with gold. Underneath the body armour was worn a *qabchah* (long gown or shirt), a jacket quilted and slightly ornamented. Silken trousers and a pair of Kashmir shawls round the waist completed the costume of a nobleman of high rank."[23] Regarding the common soldiers Mustafa tells us that "they wore a quilted thick upper garment hanging down as far as the knee. These coats would deaden the stroke of a sabre, stop the point of an arrow, and above all keep the body cool by intercepting the rays of the Sun." The entire Mughal wardrobe consisted of the following types :

Helmet :[22]

It was also known as *Khud Dabalgah* or *Top* (Pl. XXXIII). Following varieties have been noticed in it:

A. Round, plain head-piece with a vizor or nose-guard and surmounted by a square, pentagonal or octagonal small steel rod.

B. Oval-shaped with similar details.

C. Flat cap-type without a vizor or a surmounting rod.

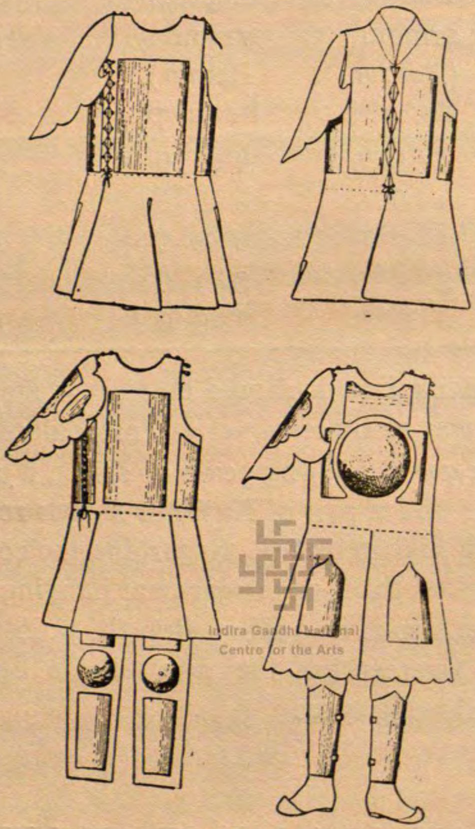
D. Separate steel plates hinged together with chains.

E. Long net-work of chains with a very small circular steel knob on the top.

F. Inverted mango-shaped.

G. Square head-piece with chains hanging down on all sides.

All these helmets were padded from inside with soft cotton, velvet, silk or *Kimkhabs*. The outer sides were damascened and the borders engraved with beautiful designs or decorated with pattern in gold and silver.



Armours

Body Armour :

It was commonly called *bakhtar* (or *baktar*) (Pl. XXXVII). Main varieties are as follows :

A. *Chahar-ainah :* Literally meaning 'four mirrors', it consisted of four pieces—a breast plate, a back-plate and two smaller plates for the sides. The front and the back pieces were rectangular while the side pieces were curved on the top to facilitate their insertion under the arm-pit. All these plates contained steel hooks and were fastened together with leather straps.

B. *Zirih :* (Pl. XLI top left). It was a coat of mail with sleeves and was of interlinked small iron chains. It generally reached up to the knee but those used by the cavaliars were short reaching up to the waist only and with cut or cleavage at the back. When open from the front, it was used as a shirt and when without hooks was worn like a vest.

C. *Jaibah* : Velvet coat of mail studded with small studs or knobs (*mikh*) all over were called *Jaibah.* In the National Museum, New Delhi a beautiful *Jaibah* of the 17th century is on display. Its borders are profusely decorated.

D. *Joshan :* A steel breast-plate extending upto the belly. It was mainly for the protection of the chest, the shape being rectangular and convex.

E. *Angrakha:* An ordinary quilted tight-fitting coat of cotton, reaching to the knees intended as a safeguard against sword-cuts. It was worn by the ordinary soldiers. It could also be used beneath the chain armours.

F. *Jamaa-i-fatahi :* A fine silken embroidered coat used by the men of higher rank. It was decorated with *Salma-sitara* work and during the battles it was used beneath the coats of mail.

G. *Bhanju :* A sleeveless jacket of mail.

H. *Kothi :* A long coat of mail worn under the breast-plate.

I. *Kamal :* This is derived from the word *Kambal* or blanket. These were coats padded with cotton or wool. "Almost every soldier in the service of native power has his head secured by many folds of cotton cloth, which not only pass round but likewise over it and under the chin and a projection for the back of the neck is provided with similar materials. The jacket is composed of cotton thickly quilted between cloths, and so substantial as almost to retain the shape of the body like stiff armour. To penetrate this covering with the edge of the sword was to be done only by the practice of cutting."[24]

J. *Kantha Sobha* : A gorget or neckpiece. Blockmann has wrongly described it as attached to the horse's neck.

K. *Heavy armours :* In heavy armours two halves of steel pieces were joined together and was difficult to carry hence used rarely.

Back armour :

For the protection of the back chained armours (Pl. XLI top right) were studded with pointed iron spikes.

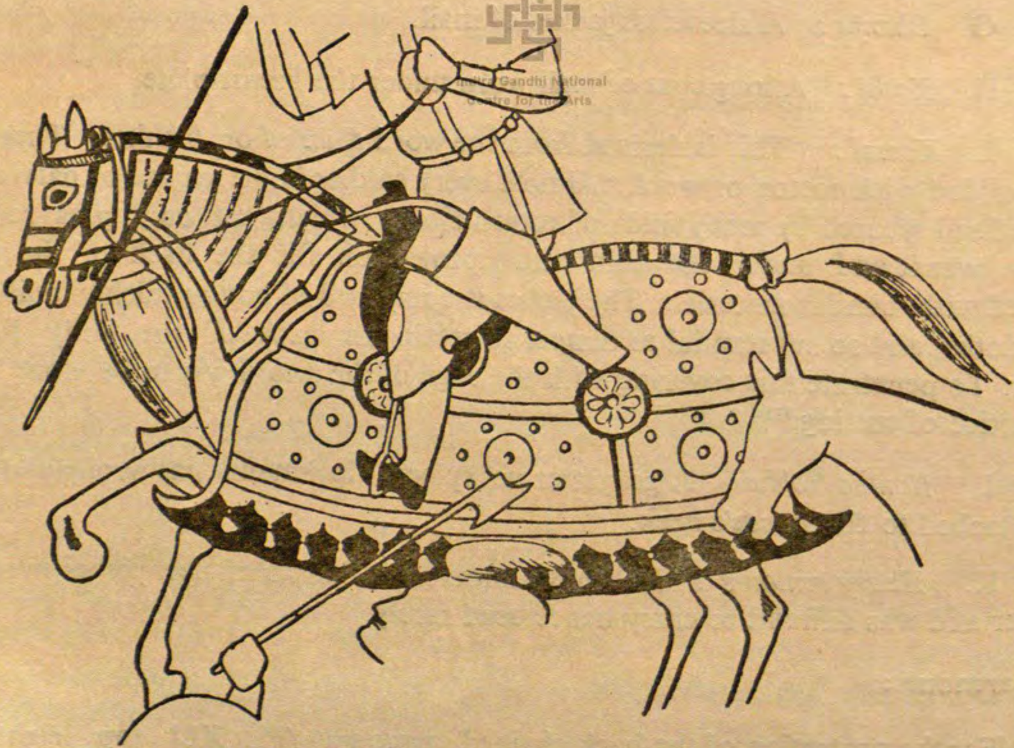
The steel plates were mostly of damascened steel and decorated with pattern-welding, *Ganga-Jamuni* and other designs. In Lahore, Murshidabad, etc., various patterns were worked out on the armours. The borders were ornamented with *Tah Nishan*, *Zar Nishan* or *Koft* work. Inscribed chain rings were also used. These armours were invariably padded with red, green or yellow velvet or silk.

Patka :

These were of leather or of multi-coloured cotton belts wrapped round the waist to hold different light weapons.

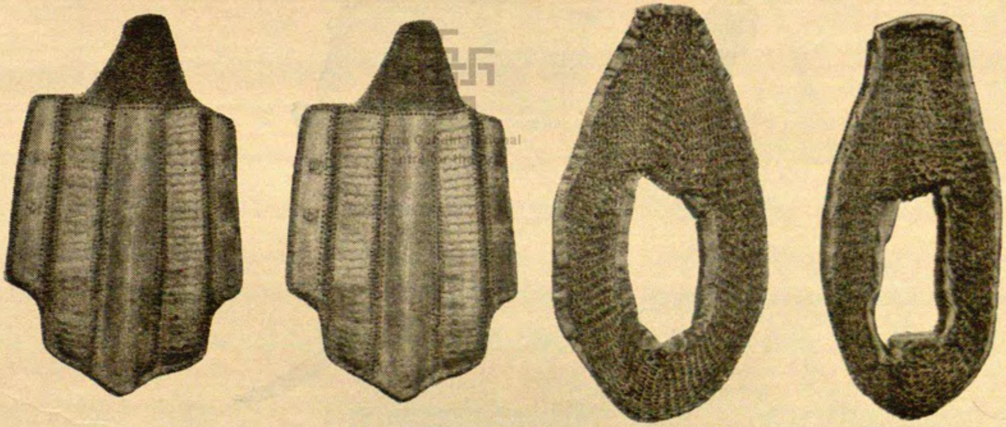
Horse-armour :[25]

The horses deployed in the battle were usually protected with armours. In several paintings of the Mughal School such armoured horses have been painted. *Kajim* was a piece for the hind portion and was stitched over a quilted red cloth called *artak-i-kajim*. *Gardani* was a frontlet, *Patta* a headstall, *inam* reins, *Zerband* martingale, *dumchi* crupper, *khogi* saddle, *ustak* sharbrasque, *bala tang* ornamental tassels at corners of saddle, etc. The *mohra* was an armour piece to cover the face of the horse lest it may be frightened. The chained armour for the same purpose was called *andhiari*. The back was covered with *pakhara*.



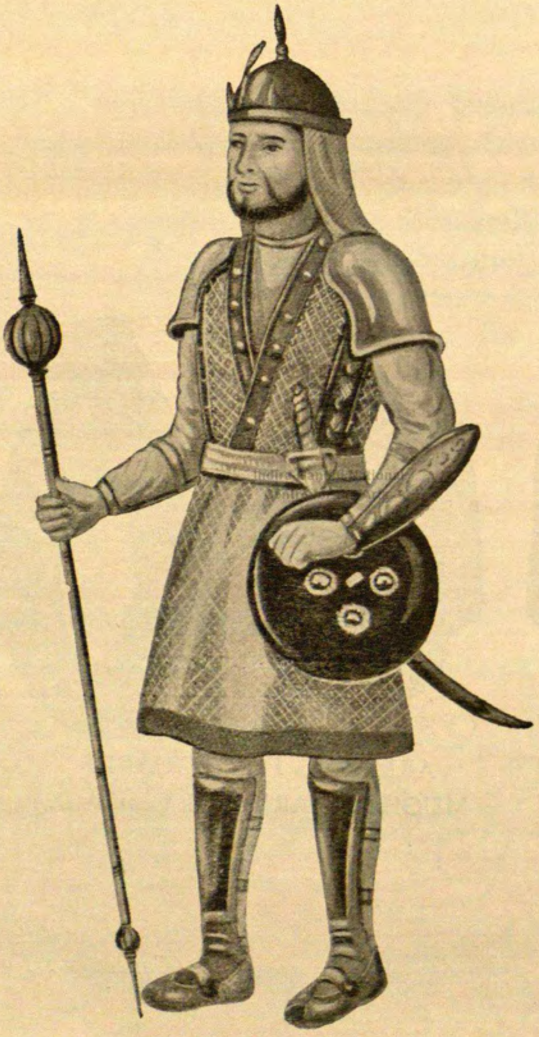
Quilted and studded horse-armour from *Kitab-i-Chingiznama* dated 1596 A.D. (after Russell Robinson)

Plate XXXVI



ARM AND FOOT GUARDS
MUGHAL, EARLY 18th Cent. A.D.

(Collection : National Museum, New Delhi.)



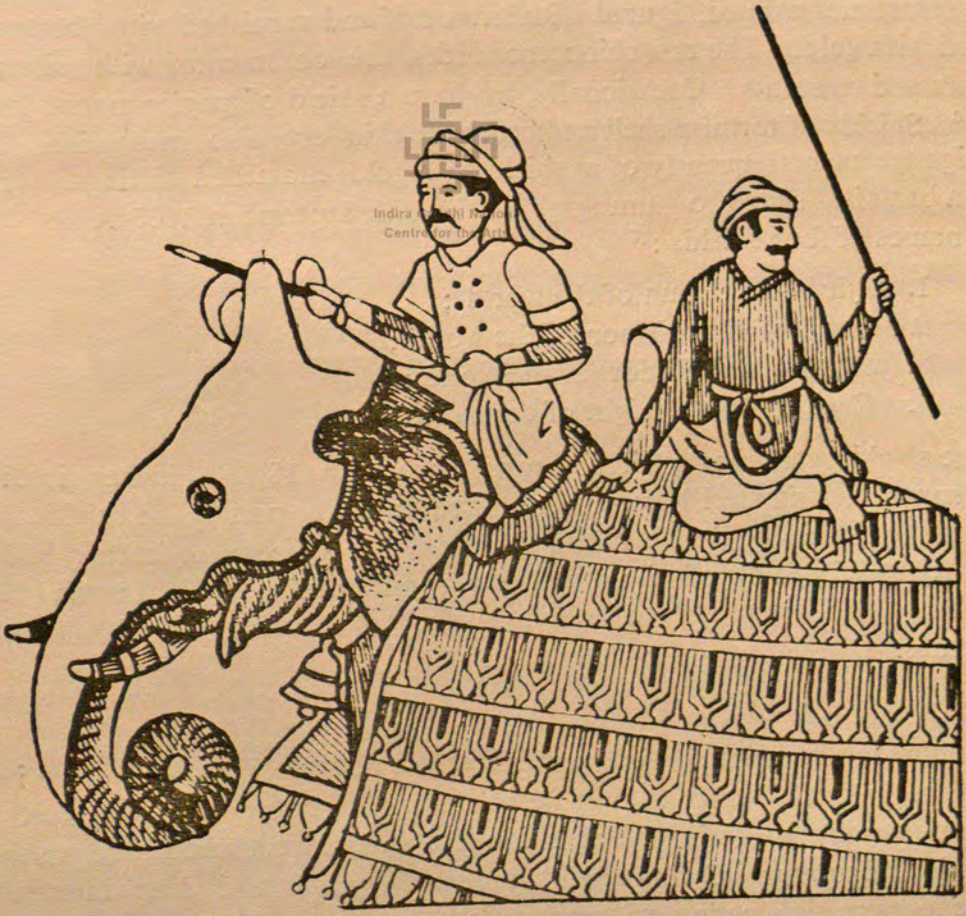
A MUGHAL SEPOY
17th Century A. D.

Hand-armour

It was called *Dastanah* and consisted of two separate steel pieces hinged together (Pl. XXXVI) The upper extended from the wrist to the elbow, while the lower portion was a little short. A velvet piece was attached to the front for covering the fingers. In the second variety chains were stitched over a quilted velvet. It was worn round the hand and fastened with hooks. When the body armour was sleeveless the upper portion was covered with similar velvet-chained pieces.

Elephant armour

Several small steel plates were affixed to a carpet and tied on to the back with the help of thick ropes. Frontlets were also used. These consisted of steel plates stitched to red cloth. Wooden *hawdahs* were placed on their backs. The hind portion was covered with chained armours. Elephants thus protected have often been portrayed in the miniatures of the Mughal school.



Armoured Elephant (after Russell Robinson)

Trousers (*Ranak*)

It was a sort of trousers made of small steel rings and fastened with hooks. It was always worn over a cotton trousers.

Foot armour

These were called *Mozah-i-achani* or iron stockings (Pl. XXXVI). It was simply wrapped over the shoes.

Shield

Four types have been mentioned in the *Ain-i-Akbari* (Pl. XXI). *Chirwah* and *Tilwah* were the shields carried by the body-guards surrounding the Emperor. *Phari* was a small shield made of cane or bamboo. *Khera* was a fencing shield. The prices of shields ranged from Rs. 50 to 4 *mohurs*. Egerton writes, "Shields are generally made of steel, *Sambur* skin, buffalo, *Nylghau*, elephant and rhinoceros hide which are most prized. These are sometimes painted, figured with silver leaf and varnished with bosses lightly ornamented with gold. The raw rhinoceros hides are ornamented with silver or gilt bosses, stars and crescents. Occasionally, we have a shield of 'papier mache' lacquered and gilt.'"[26] Shields of tortoise shell and crocodile skin are also met with. In Shah Jahan's reign we hear frequently of a shield with gold enamelled fittings. Travenier presented a beautiful shield to Aurangzeb on the 12th September, 1665 A.D. Manucci gives the names of four shields :[27]

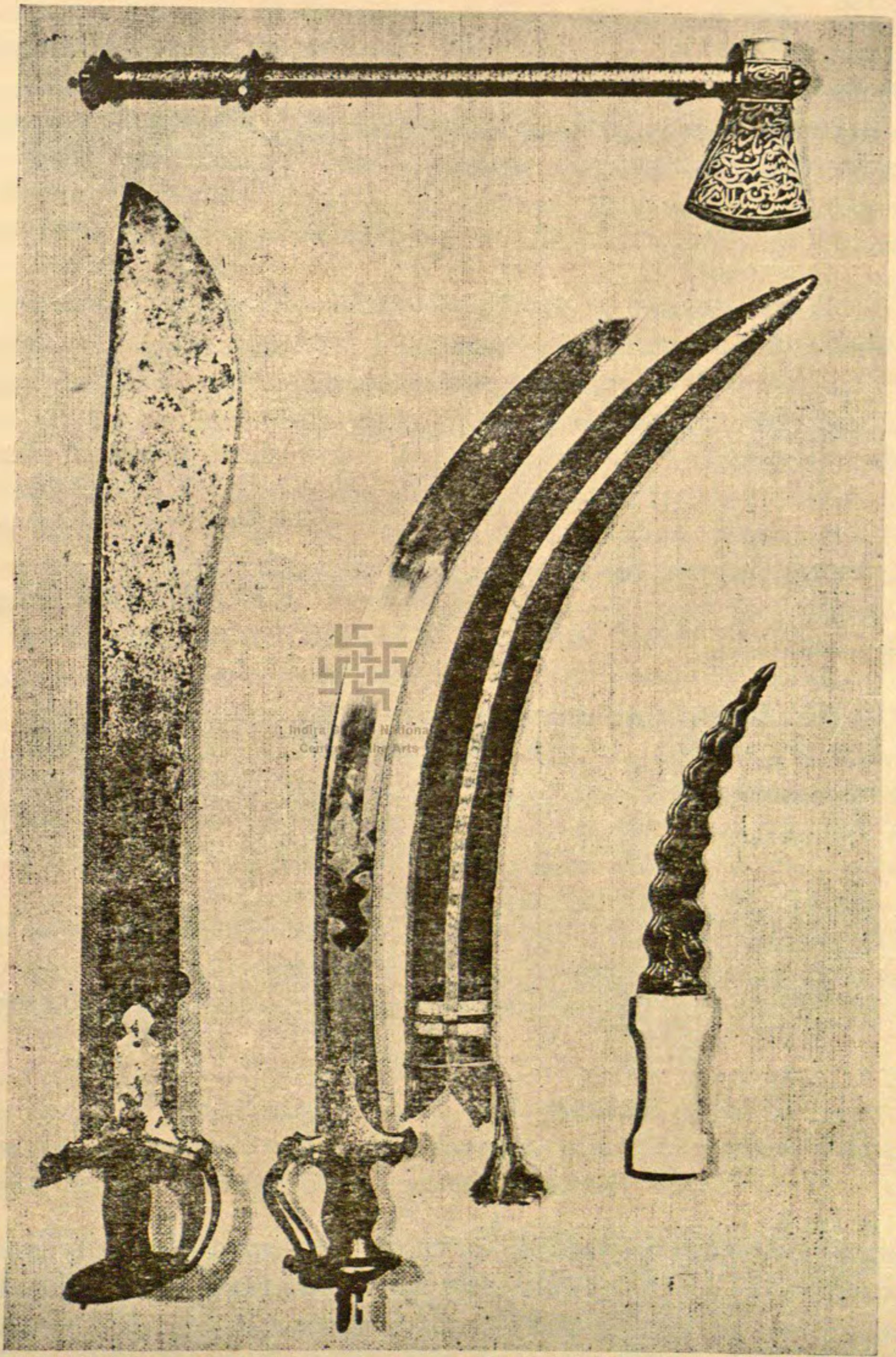
1. *Aftab-i-alam*, Sun of the world ;
2. *Mahtab-i-alam*, Moon of the world ;
3. *Sayr-i-alam*, Shadow of the world ; and
4. *Roshani-i-alam*, Light of the world.

The shields were mostly circular ranging between 18 to 26 inches in diameter. Four and sometimes six steel bosses were fitted into the part. The shields made of elephant hide were the costliest. The Brahmanas who objected to leather, had shields made of forty or fifty folds of silk painted red and ornamented. In the National Museum, New Delhi are preserved several Mughal shields painted with hunting and fighting scenes.

Fire-arms

Timur took keen interest in the manufacture of guns (Pl. XXXIV). He imported several gunsmiths from Turkey to prepare harquebus for him. Babar confined himself to the heavy cannons but during Akbar's time matchlocks were made under the personal direction of the Emperor. Owing to his inventive genius and deep interest several improvements were also made. "Several things are marked", says Abul Fazl, "on

Plate XXXVIII



HISTORICAL WEAPONS
Top : BATTLE-AXE OF NADIRSHAH
Below : Left to Right : KHANDA OF AURANGZEB, SWORD OF TIPOO, DAGGER OF AURANGZEB

(Collection : National Museum, New Delhi.)

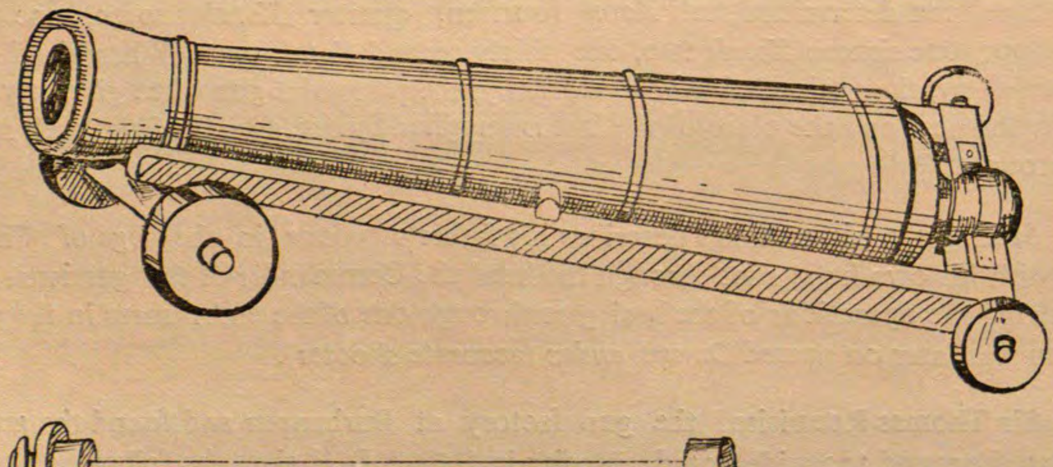
every matchlock, viz. the weight of the raw and the manufactured iron.., the place where the iron is taken from, the workmen, the place where the gun is made, the date, its number". When ten such guns were ready, Akbar ordered to inlay the end of the barrel and the wooden stock with gold. An account given in the *Ain-i-Akbari* deserves mention here : "The imperial arsenal contains manufactured, purchased and presented guns. Each of them is either long or short, and these are again sub divided into *Sada* (plain), *Rangin* (coloured) and *Koftkar* (damascened) guns. His Majesty has selected out of several thousand guns, one hundred and five as *Khasa*, i e. for his special use. First twelve in honour of the twelve months, each of them is brought back in its turn after eleven months. Secondly, thirty for every week, after every seven days one goes out and another is brought. Thirdly, thirty two for the solar days ; one for every day. Fourthly, thirty one *Kotals*. Sometimes there are only twenty eight. Whenever some of the former guns have been given away *Kotals* are brought to supply their places. The order of precedence is as follows, the guns for the month, the week, days, *Kotals* plain, coloured, *Koftkar* not handed over to the slaves, *Koftkar* handed over to the slaves, long ones selected from *Peshkash* presents or from such as were bought ones, *Damanakh* selected from *Peshkash* or from bought ones, such as has been chosen from selection of both. The one hundred and five *khas* guns are divided into seven parts, every fifteen from a *Kishk* or guard and are always kept ready by the slaves. On Sundays two are taken from the first, four from the second, five from the third, four from the fourth. This order is also followed on Mondays, Tuesdays and Wednesdays. On Thursday again two are taken from the first and four from the second, four from the third, five from fourth. In order to supply the places of such *Khas* guns five other classes have been determined, half *Kotals* fourteen, quarter *Kotals* seven, one eight *Kotals* four, one sixteen *Kotals* two, one thirty second *Kotals* one. When *Kotal* guns are given away, they bring half *Kotals* similarly, the place of a gun when given away is taken by the next and the place of the last is supplied by one selected from such as has been brought."[28]

Jahangir in his memoirs describes his father's valour in the siege of Chittor. Akbar with his own hand shot through the head the Commander of the garrison, who was viewing the operations of the besiegers through one of the embrasures in the place. This gun was later on named *Durust andaz* (accurate shooter).

Sir Thomas Roe visited the gun factory at Burhanpur and found the guns of brass too short and too wide bored. Bernier in 1658 A.D.,[29] gives the following account of the battle between Dara and Aurangzeb on the Chambal river, "The former placed in the front all his cannons, causing them to be tied, one to the other with chains to shut the passage to the cavalry. Behind these pieces of cannons he placed also, front wise, a great number of light camels on the forepart of the bodies whereof they fasten a small piece of the bigness of a double musquet, a man sitting on the hind part of the camel, being able to charge and discharge without lighting, behind these camels stood the greatest part of the musqueteers of the rest of the army which chiefly consisted of cavalry furnished with bow and arrows (as ordinary are the Mughals) or with a sword and kind of half pike as commonly are the Rajputs ....on the other side Aurangzeb and Murad put also their army almost into the same order, except that in the midst of the troops of some *Omrahs* they hid some small field pieces. They hardly made use of any more art, only they placed here and there some men casting banners (*ban* i. e. rockets) which is a kind of grenade fastened to a stick, that may be cast very far through the cavalry, and which extremely terrified horses, and even hurts and kills sometimes. All this cavalry turns about very easily and they draw their arrows with marvellous swiftness, one man being able to draw six of them before a musqueteer can twice discharge his musquet ....All things being thus disposed the artillery began to play on both sides for it is always cannon which makes the prelude amongst them, ..." Following are the main types of the fire-arms used by the Mughals :

Heavy guns

Babar used cannons of considerable size. In his memoirs he describes a cannon at Agra under the supervision of ustad Quli Khan, "Around the mould they



Cannon

had erected eight furnaces for melting the metal. From the foot of each started a channel which ended in the mould. As soon as I had arrived, the holes to allow the flow of metal were opened. The fused metal rushed into the mould like boiling water. After a time before the mould was full, the fused metal from the furnaces began to flow very slowly, either, because the size or the amount of material had been wrongly calculated, Ustad Quli Khan, in a state that cannot be described, wished to fling himself into the very midst of the melted copper. I made much of him, ordered him a robe of honour, and thus succeeded in claiming him. A day or two afterwards, when the mould had cooled down, it was opened Ustad Quli Khan overwhelmed with joy, sent me word that the bore (*Ame)* of the piece had no fault and that a chamber could easily be made in it. The body of the cannon was then uncovered and a certain number of artificers were set to finish it, while he busied himself with the preparation of the chamber."[30]

These guns were given high sounding names and were drawn by bullocks, horses, camels or elephants. These were mounted on heavy wooden carriages (Pl. XXXIV, fig 1). Horn has given the exact dimensions of one of Shah Jahan's cannons found at Murshidabad.[31]

Maximum Length	17 feet
Depth of bore	15 feet
Diameter at Muzzle	1 foot
Diameter of bore	6 inches.

he following are the details for the great gun of Agra ·

Nature	1500 lbs brass
Weight	1049 cwt 1 grs. 4lbs

Diameter of the Calibre	22.5 inches
Diameter of the Chamber	10.8 inches
Diameter of the Muzzle	46.5 inches
Diameter of the Trunnion	11.3 inches
Diameter of the Base ring	48.6 inches
Length of the chamber	51 inches
Length of the chase including the chamber	156 inches
Length of the Piece	169.5 inches
Weight of the shot of iron	1497.39 lbs
Weight of the shot of marble	567 lbs

The value of the gun was estimated to be more than one lakh rupees.

Light guns :

Gajnal, *Hathnal*, *Shutarnal*, *Zamburak*, *Dhamakah*, *Ghabarah*, *Deg* have been discussed in detail under the Sikh artillery. *Badiijah*, *Manjaniq* and *Sarkob* were battering arms employed in the siegecrafts. *Sangrad* was a stone ball for a cross-bow, *Ramjanki* was a field piece, *Organ* "is composed of about 36 gun barrels so joined as to fire at once",[33] and *Qasarah* was a field gun. The carts were called *Arabah* and *Rakkalah* while the powder magazines *Barudkhana*.

Matchlock & Flintlock guns

It was also called *Tufang* and was used by the infantry. Akbar's matchlocks were of two sizes 66" and 44". "They were made of rolled strips of steel with two edges welded together. The barrel was damascened and decorated with gold or silver wires." The barrels sometimes bore inscriptions too. The wooden stock was inlaid with ivory. The heavy matchlocks were mounted on tripods and called *Sakh-i-tufang*. In the beginning these were loaded with muzzle loading rods. *Chaqmaki* or *Toredar* (flintlocks) were introduced at a late stage. Percussion cap system was introduced in the end of the eighteenth century. Imported matchlocks called *Tufang-i-firangi* were very costly and were much in demand.

That the flint gun was very rare is confirmed by Jahangir. In his memoirs he says, "I had in my possession a certain fowling pieces, for which I understand Mirza Rustum had offered to the former owner the sum of Rs. 12000 and 12 horses without success. As this appeared to me an extravagant piece I wrote to enquire what were the peculiar excellences of the piece and I was informed in reply that if fired 100 times successively without intermission, it was never inconveniently heated, and secondly, that that was a flintlock and not a matchlock, being self-igniting, thirdly a ball discharge from it never missed the mark, and lastly that it carried a ball of five *Mathkals* weight".[34]

Powder horn

The set consisted of a powder flask (Pl. XXIV), bullet pouches, priming horn (*Singra*), matchcord, flint and steel. All these were attached to the leather belt embroidered in gold.

Miscellaneous

Pistols were introduced in the early 18th century. Multi-barrelled pistols are exhibited in the National Museum, New Delhi. *Sherbachah*, carbines, mortars, howitzars were the same as the ones used by the Sikhs.[35]

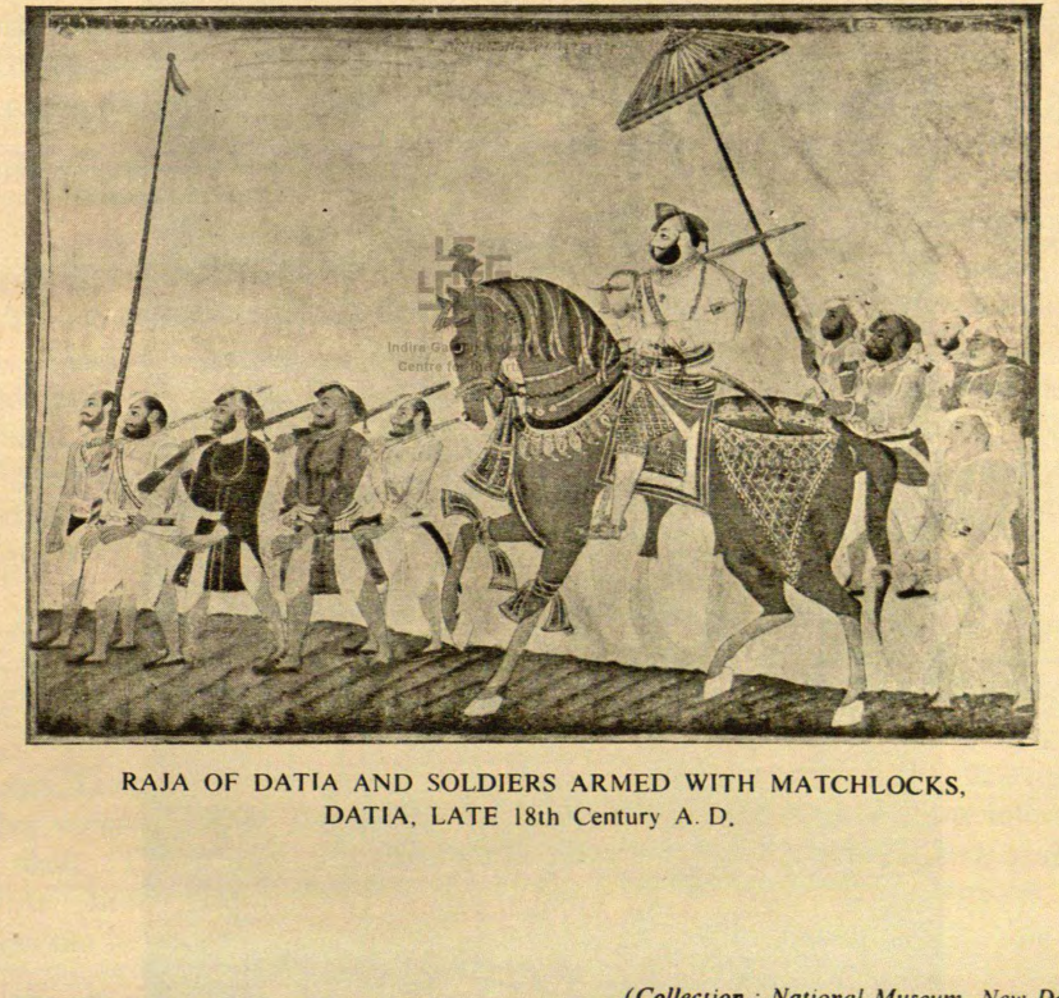
References

1. F.S. Bajwa: *Military System of the Sikhs (1799-1849)*, (Patna, 1964), p. 3.
2. William Irvine : *The Army of the Indian Mughuls* (New Delhi, 1962), p. 75 and *British Museum Munuscript* No. 6599, folio 84 a.
3. Collection of M. Cortier, Paris.
4. Archaeological Museum, Red Fort, Delhi.
5. For details please see the chapter on 'Sword'.
6. William Egerton : *Illustrated Handbook of Indian Arms* (London 1880), p. 114, note to No. 457 and Irvine, *op. cit.*, p. 93.
7. For details please see the chapter 'Orign and development of Archery'.
8. H. Blochmann : *Ain-i-Akbari* (tr) (Calcutta, 1873). Vol. I, p. 111 ; Egerton, *op. cit.*, p. 23, plate i, No. 35 and Irvine, *op. cit.*, pp. 79-80.
9. *Ibid.*, Plate XII, fig. No. 22, Egerton, *op. cit.*, Plate i, No. 22, Irvine, *op. cit.*, pp 80-1 ; and *Mirat-ul-Islilah*, fol. 1936.
10. *Ibid.*, *op. cit.*, Vol. I, p. 112 ; *Egerton*, *op. cit.*, pp. 115, 123, 130 ; Irvine, *op. cit.*, pp. 81-3; and Abdul Aziz, *Jewellery and the Arms of Indian Mughals*, p. 10.
11. William Irvine : *op. cit.*, p.83.

12. *Ibid.*, p. 85, Mustafa's *Seir* (tr) Vol. I, p. 549, note 53 ;Blochmann : *op. cit.*, Vol. I, p. 112, Pl. XII fig. 4 ; and Egerton, *op. cit.*, Pl. IX figs. 344-5, p. 102.
13. Abdul Aziz : *op. cit.*
14. Blochmann : *op. cit.*, Vol. I, p. 110, Pl. XII, No. 5 ; Irvine, op. cit., p.86-7 ; Egerton, *op. cit.*, pp. 116, 131 and Mustafa, *op. cit.*, Vol. I, p. 152, note 114.
15. Abdul Aziz : *op. cit.*
16. Blochmann : *op. cit.*, Vol.I, p. 110 ; Egerton,. *op, cit.*, Pl. I, No. 28 ; Irvine, *op. cit.*,p. 88 and F. Steingass, *Persian-English Dictionary* (1892), p. 527.
17. *Ibid.*, Vol. I, p 110, No. 9 ; Egerton, *op. cit.*, pp. 82, 116, 145 ; Yule and Burmell, *Glossary* (1886) p. 357 ; and Irvine, *op. cit.*, p. 87.
18. Abdul Aziz : *op. cit.*
19. William Irvine : *op. cit.*, p. 89; Abdul Aziz, *op. cit.*, Egerton, *op. cit.*, p. 144; Blochmann, *op. cit.*, Vol. I. p. 111 ; and *Ibrat-namah* (India office Library, London), No. 252, fol. 348.
20. Blochmann : *op. cit.*, Vol. I, p. 110, Pl. XII, fig. 11; Egerton, *op. cit.*, and Irvine, *op. cit.*, p. 87.
21. William Irvine : *op. cit.*, p. 63; *British Museum Manuscript* No. 6599, fol, 162a.
22. William Egerton : *op. cit.*, p. 112, note to No. 440.
23. Blochmann : *op. cit.*, Pl. XIII fig. 43 ; Egerton, *op. cit.*, p. 134 and Irvine, *op. cit.*, p. 65.
24. Valentine Blacker : *War*, p. 302 and Irvine, *op. cit.*, p. 70.
25. William Irvine : *op. cit.*, p. 72.

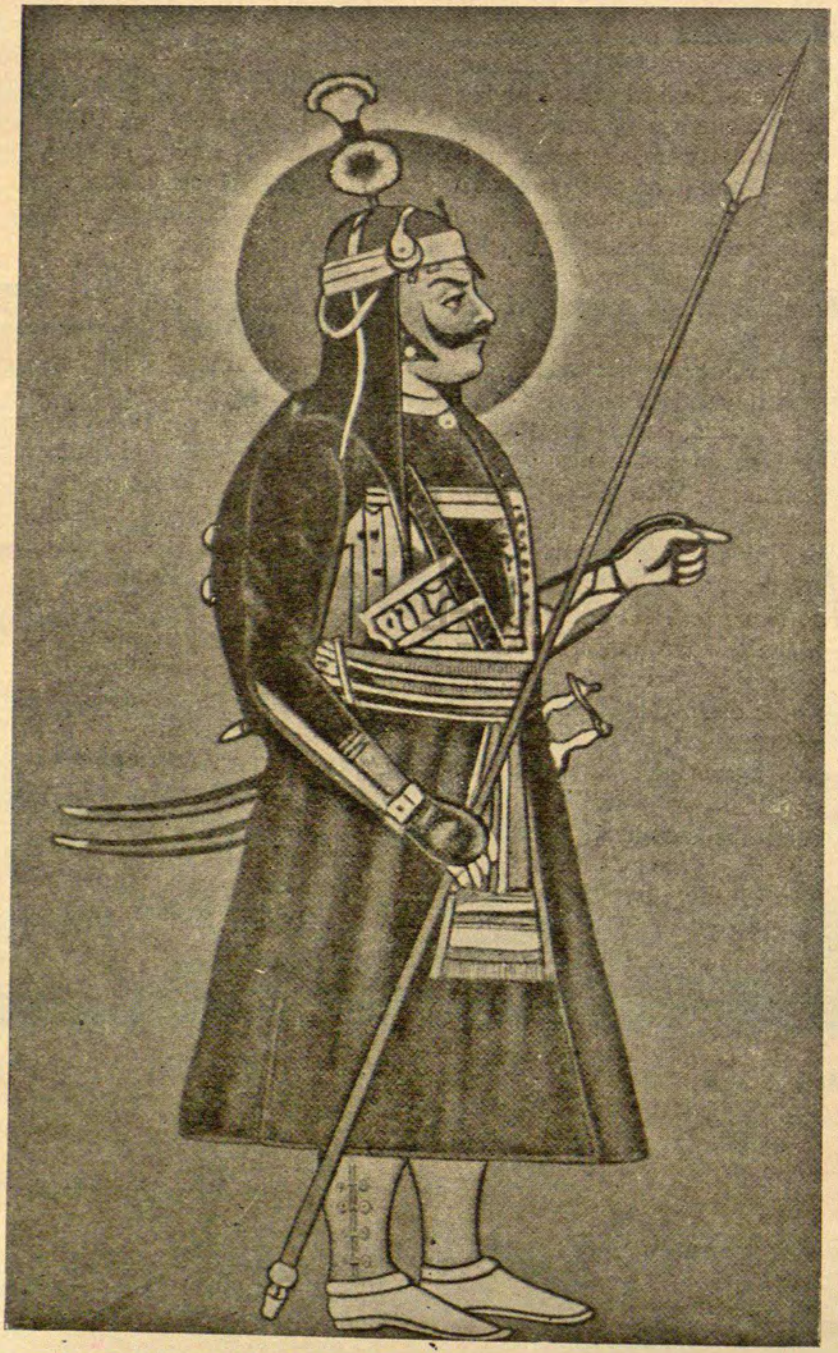
26. William Egerton : *op. cit.*, p. 111 ; Abdul Aziz, *op. cit.*, and Irvine, *op. cit.*, p. 78.
27. Abdul Aziz : *op. cit.*
28. Blochmann : *op. cit.*, (Under the ranks of gun) and Abdul Aziz, *op. cit.*
29. F. Bernier . *Travels in the Mughal Empire,* 2nd ed. (1891), pp. 74, 157 and Egerton of Tatton, *Indian and Oriental Armour,* new ed. (London 1896), p. 25.
30. *Babar Namah* (tr) Vol. II, p. 253 and Irvine, *op. cit.*, p. 114.
31. Dr Horn : *J.A.S.B,* XVI, p. 589 and Irvine, *op. cit.*, p. 123.
32. William Irvine : *op. cit.*, p. 125 and Major Thorn, *War*, p. 188.
33. H. Compton : *Military Adventures*, p. 61 ; *Steingass, op. cit.*, p. 38 and Irvine, *op. cit.*, p. 138.
34. Major Price (tr) *Autobiographical Memoir of Jahangir* (1829), p. 63, and Egerton of Tatton, *op. cit.*, p. 24.
35. For other fire-arms please see the chapter on 'Sikh-Arms' and for ornamentation the chapter 'Decoration on Arms'.

Plate XXXIX



RAJA OF DATIA AND SOLDIERS ARMED WITH MATCHLOCKS, DATIA, LATE 18th Century A. D.

(Collection : National Museum, New Delhi.)



MAHARANA PRATAP AS A FULLY ARMED WARRIOR,
RAJASTHAN, 18th Century A. D.

RAJPUT ARMS

Rajasthan has always been famous for its valour and bravery. Every Rajput is a born soldier (Pl. XLII). Hence in their days, Rajasthan could produce everything necessary for warfare. Weapons were the trusted friend of a Rajput. Jaipur has been famous for its damascening, Sirohi for its blades and Alwar for its variety in weapons. In Rajasthan are to be found weapons of every age, ranging from those which the aboriginal tribes Bhils and Neena have used since the earliest days down to the newest automatic rifles. These types of arms are so mingled with the contemporary Mughal and Sikh weapons that it is difficult to distinguish them. Here, only those types strictly known to the Rajputs, are dealt with.

Bows and Arrows

The bow was the principal offensive weapon of the Rajputs in early days. All types of bows, i. e. single curved, double curved and triple curved were known to them. Their bows were generally of bamboo or cane but the metal bow was equally popular. These bows were beautifully carved with geometrical designs, images of gods and goddessess and also bore inscriptions. The most peculiar is the unstretched bow. It was curved in a round manner both the ends almost touching, with notches on the inside. But when the two ends of the stave were heated the stave automatically stretched and converted into the usual bow. This was made of cane coated with lacquer and painted with beautiful scenes in brilliant colours.

Another important variety was the cross-bow. This worked by tension. Loosely fixed to the bow, a hollow piece of horn lay over a straight iron stock. The stave of the bow was attached to a hook of the iron shaft and the string was pulled with a sort of trigger. Inside the hollow barrel were kept small arrows with an average length of nine inches. The points of the arrows were round, square-shaped, pentagonal, octagonal, etc. They were one inch or so in length with a small iron tang for insertion into the wooden shaft. These arrows were discharged one by one by the trigger and worked like bullets. In the Alwar Museum, Alwar is preserved a cross-bow. Arrows for cross-bow can be seen in the National Museum, New Delhi.

The Rajputs used almost all types of arrow-heads including the crescent-shaped. A Rajput quiver made of cotton and embroidered all over but of a comparatively later date is displayed in the Gallery of Arms, National Museum, New Delhi. Along side is kept the arrow-puller by which the arrows were drawn from the quiver.

The 'Gulel' or pellet bow from which balls of desired size could be discharged with considerable accuracy and force were also used.

The long bow of the Bhils is made of bamboo. Even the string is of bamboo except the ends which are of gut. The arrows are of reed, tipped with rough iron points. For further details please see Chapters 'Origin and development of Indian Archery' and also 'Mughal Arms'.

Sword

All the varieties discussed under Mughal sword were known to the Rajputs. The famous *Khanda* of Man Singh is preserved in the City Palace Museum, Jaipur. In the National Museum, New Delhi is a sword of Maharana Hamir Singh. In several miniatures of the Rajput School the warriors have been portrayed carrying different types of swords.

Misc

Apart from the main types discussed the following weapons are noteworthy:

1. Gaj Ghao

Elephant goad or *Ankush*. It is made entirely of iron having floral designs all over . The end is globular and edge is pointed. Both the straight and the curved ends are decorated with *Lahariyadar* motif.

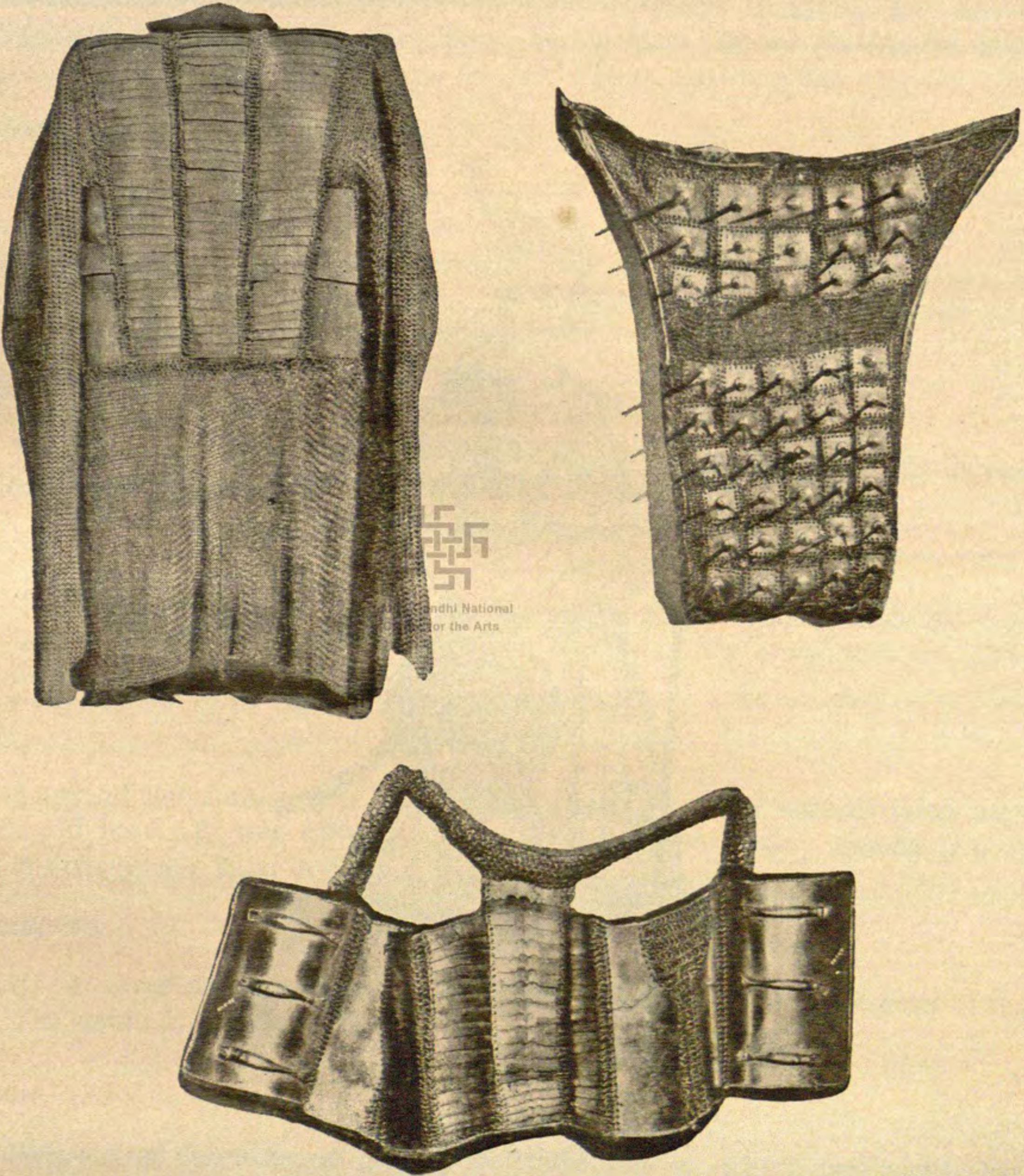
2. Kulang Guptidar

Also known as *Jaghnol* (Pl. XLIII). This was a plain iron shaft with blade attached to its side like a battle-axe. The blade is like the beak of a bird. The hollow shaft contains a *Gupti* (concealed weapon).

3. Bichhva

A small dagger with a zig-zag blade. The blade, on both the sides, bears ribs. The hilt has a knuckle-guard. In one specimen *Natesa* (Lord Siva) has been depicted, with a *Kirtimukh* above and Nandi below. The hilt was originally silver plated. It exhibits Maratha impact.

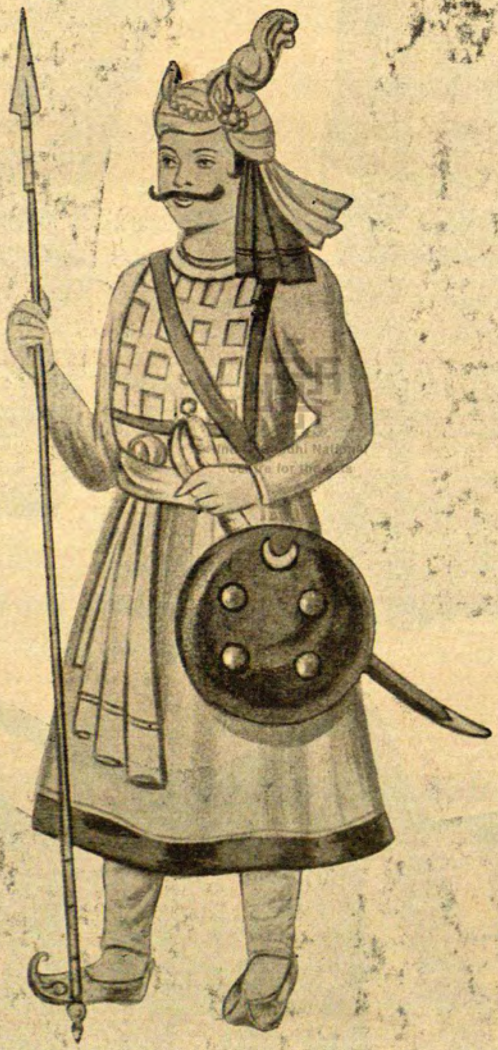
Plate XLI



ndhi National
or the Arts

RAJPUT ARMOURS
RAJASTHAN, Early 17th Cent. A. D.

(Collection : National Museum, New Delhi.)



A RAJPUT SOLDIER
17th Century A. D.

4. Maroo Dhaldar

A small shield of iron having four knobs and a crescent of metal. Two spear-shaped pointed rods project on the two sides. On the inner side is a rectangular grip. The type has been evidently derived from the *Bhid Chir* of the Marathas.

5. Parasu

The Battle-axe was entirely of steel. In one of the specimens the blade is engraved with an elephant-rider sitting in a howdah. The iron rod is brass plated at its lower end. On the back side of the blade are fitted two steel leaves. The hollow shaft contains a knife. In another variety the blade is perforated and depicts mythological animal and other floral motifs.

6. Phool

This was ovalshaped having tongs with leaf-like ends intended for the bodies of soldiers. Their ends were decorated with floral designs.

7. Tabar

A variety of an axe where a steel blade is attached to a wooden rod on its side. It was virtually a domestic weapon for splitting or cutting the wood and was used in actual warfare only in emergencies.

8. Tal

A type of club consisting of a curved iron rod at the upper end and fitted with a leaf-shaped head. It was intended for striking on the head. Usually it bore decorations comprising floral designs.

9. Jambuwah

It is a curved dagger embossed with medial rib (*Mang*) on both the sides of the blade. The handle is made of wood.

10. Panja

Palm-shaped accoutrement used by the soldiers for scratching their backs when fully armed with heavy tunic. An imitation of the Mughal *Pustakhar*. This is one piece of iron plated with gold.

11. Kulang

An Imitation of Mughal *Jaghnol* is also known as *Chuga*. An iron rod having a globular end and a slightly curved blade with ribs is attached like an axe to one side at the uppermost end.

12. Dohra Gurj

Two *Gurjs* were fitted one over the other. The small steel rod served as the shaft.

13. Sota

It was a wooden stick fitted with brass nails all over. At the lower end was a metal cap and a globular grip at the top.

14. Gataka

It was a stick of copper plated with brass all over and the main body contained two globular heads at the ends.

15. Spears

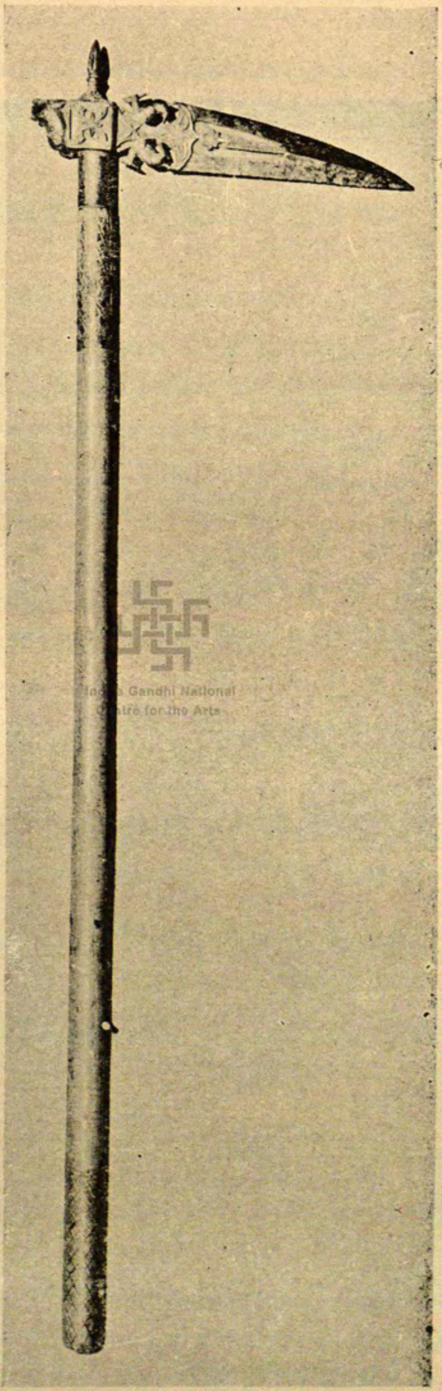
All types of spears i. e. *Neza*, *Barachha*, *Bhala*, etc., were used by them. In a beautiful painting, now in the National Museum, a horse-rider has been shown hurling an abnormally long spear (Pl.XLIV). Maharana Pratap has often been depicted carrying his *Bhala* (Pl.XL). The effectiveness of this weapon was proven in the battle of Haldighat. In the National Museum, New Delhi an ivory spear is on display. It would be interesting to note that almost all these varieties are on display in the National Museum, New Delhi.

Defensive Armour

Like the Mughals and Sikhs, the Rajputs also used helmets, body armours, trousers, foot-armour, hand-armour etc., which were of damascened steel and profusely decorated (Pl.XLI). The shields of Rajasthan are specially famous for their intricate designs, colour schemes, *Ganga-Jamuni* and pattern welding work and have been separately discussed under the chapter 'Decoration on Arms'.

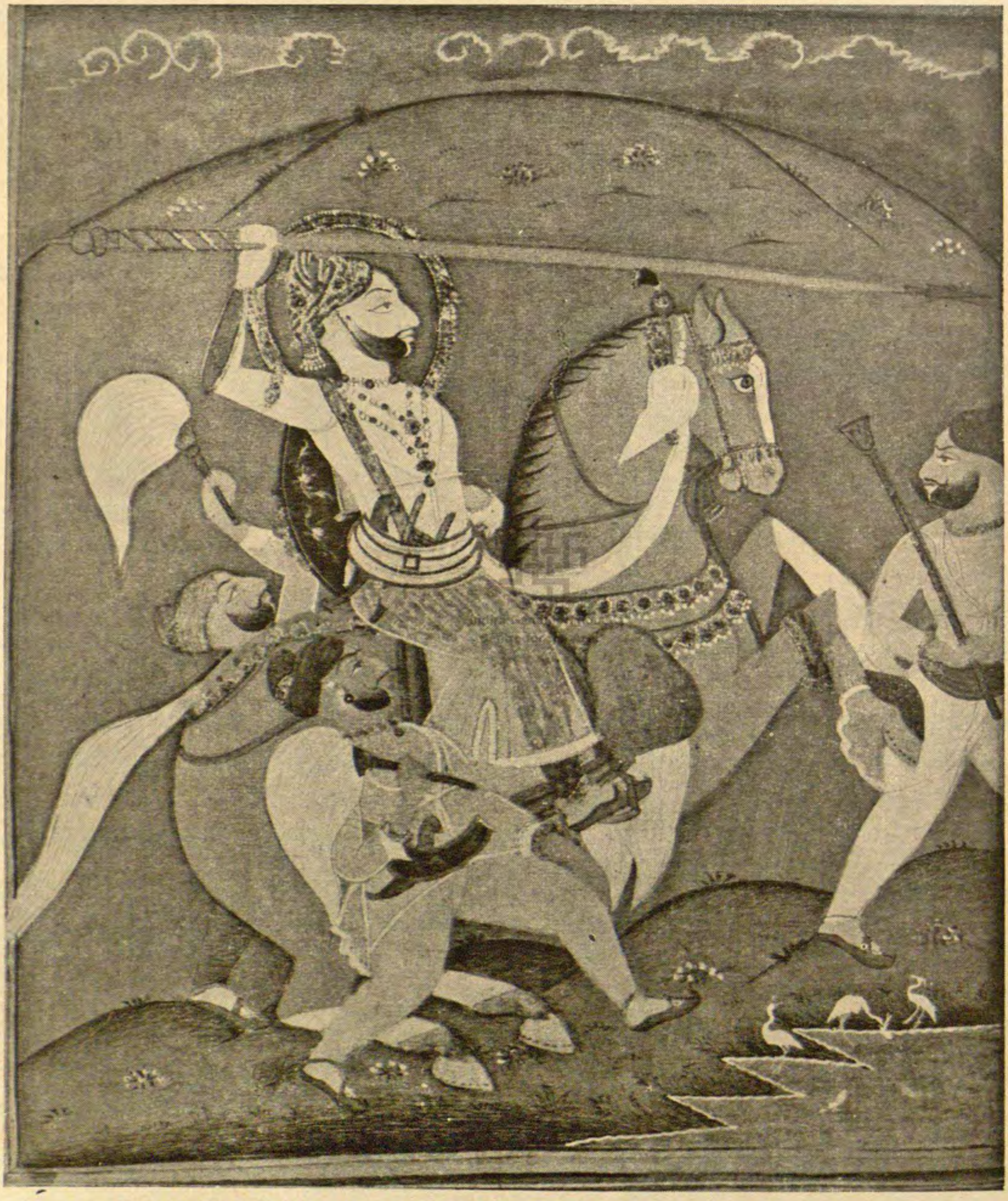
Fire Arms

The Rajputs did not invent any new type but adopted those known to the Mughals, Marathas, etc., which have been extensively dealt with in other chapters (Pl.XXXIX).



JAGHNOL,
RAJASTHAN, C. 1725 A.D.

(*Collection* : *National Museum, New Delhi.*)



EQUESTRIAN PORTRAIT OF A RAJPUT HOLDING A SPEAR,
MARWAR, MID. 18th Cent. A. D.

(*Collection* : *National Museum, New Delhi.*)

MARATHA ARMS

The study of the Marathas has always been a source of inspiration to the student of Indian history. They were the last indigenous empire-builders. Both their rise and fall were sudden events of Indian history. The uniqueness of the Maratha movement lies in its national character.[1] It was not the creation of any single individual but it was born out of virtues of a great people, stout in physique and inspired by the Bhakti Movement. The geographical hardships of Maharashtra made its sons brave, heroic and patriot. In ancient times, Maharashtra region was ruled successively by the Mauryas, the Satavahanas, the Chalukyas, the Vakatakas, the Rashtrakutas, etc. Hieun Tsang has written, "the inhabitants (of Maharashtra) were proud, spirited and war-like, grateful for favour and revengeful for war."[2] The dawn of the 17th century found Marathas occupying high military positions in the adjacent governments and in the 18th century the Marathas became a terror to the rulers of the land mainly due to their success in the military campaigns and guerilla tactics in warfare. The Maratha army moved from place to place with such an incredible speed that the bewildered victims credited them with knowledge of 'Black Magic.' "The question is" writes Cosme da Guarda, "still unsolved whether he (Sivaji) substituted others for himself or he was a magician or devil was in his place."[3]

The arms and the equipments of the Maratha army were of a heterogenous character. While they adopted new weapons they did not reject the old ones.[4] Our idea of the military organisation of the Marathas in early times is rather hazy. In the Maratha weapons no evolution is visible, no development is perceptible and no chronology is traceable. Here we find the "hybrization", of both the old and new types, although this tendency is not easily perceptible. Weapons of the Marathas have been broadly classified in the following order :

Stones

Stones were certainly used as missiles by the Marathas. Fryer says, "on the top of the mountains several fortresses of Siva Ji's only defensive by nature needing no other artillery but stones, which they tumble down to their foes, carrying as certain destruction as bullets when they alight."[5] Again in the battle of Udaigiri *Hat dhonda* or stones were used as missiles and shot from matchlocks.

Bows and Arrows

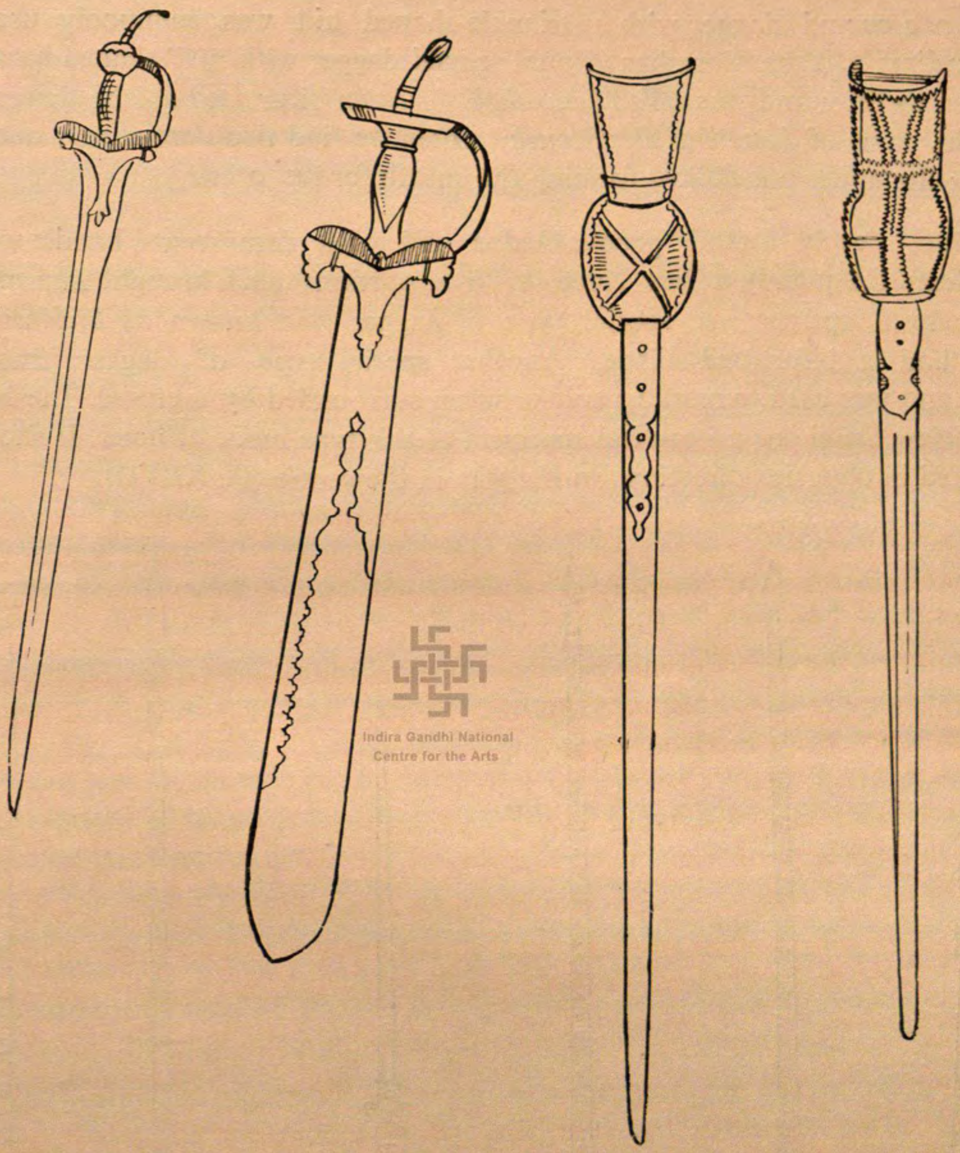
This composite weapon has remained popular in India throughout the ages. In the contemporary Maratha paintings, bows and arrows have been frequently depicted. John Henry Grose observes, "They (Marathas) have also among them excellent slingers and archers." Nearly forty years later Tone has confirmed the use of this weapon by Marathas which was still effective in 1761 in the battle of Panipat. During this battle Shejwalkar points out that "by Ahmad Sultan's good fortune an arrow struck Vishwas Rao, killing him outright."[6] Bows were of bamboo and steel. Marathas could wield the cross-bows as well.

Swords

Swords were commonly used by the Marathas and in fact they relied more on them. These swords were generally of good temper. In 1675, Sivaji laid siege of the fortress of Phonda where the sword was the most-used weapon. In the third battle of Panipat three thousand Duranis were cut down by the sword and the rest fled unable to withstand the fury of the Maratha charge. Confirming their swordsmanship says Tone, "They are also excellent swordsmen and are usually employed in making a charge upon any confusion in enemy."[7] In the cavalry charge sword was more reliable than musket or *bandook*. Maratha swords were both straight and curved. That of Nana Rao Peshwa at present in the National Museum, New Delhi is slightly curved, single-edged at the beginning and double-edged towards lower end. The hilt is of *Gilota* type with its straight quillon and round pommel.[8] The knuckle-guard was a common feature in the Maratha swords. The straight swords were generally very long and double-edged.

Many varieties of swords have been depicted in the Maratha school of painting. The National Museum has in its collection seven such paintings. The *Patia* or a long straight sword, double-edged with long knuckle-guard was also popular. Sometimes, we find narrow-bladed straight rapier with gauntlet hilt, in which western influence could be traced.

The most peculiar variety was *Khanda*. Many types of *khandas* had been used by the Marathas : *khanda* with broad blade, with open-work brass mount, *khanda* having curved blade towards the end, etc. A beautiful specimen in the National Museum collection having double-edged blade, mount-gilt, and long knuckle-guard is of particular interest.



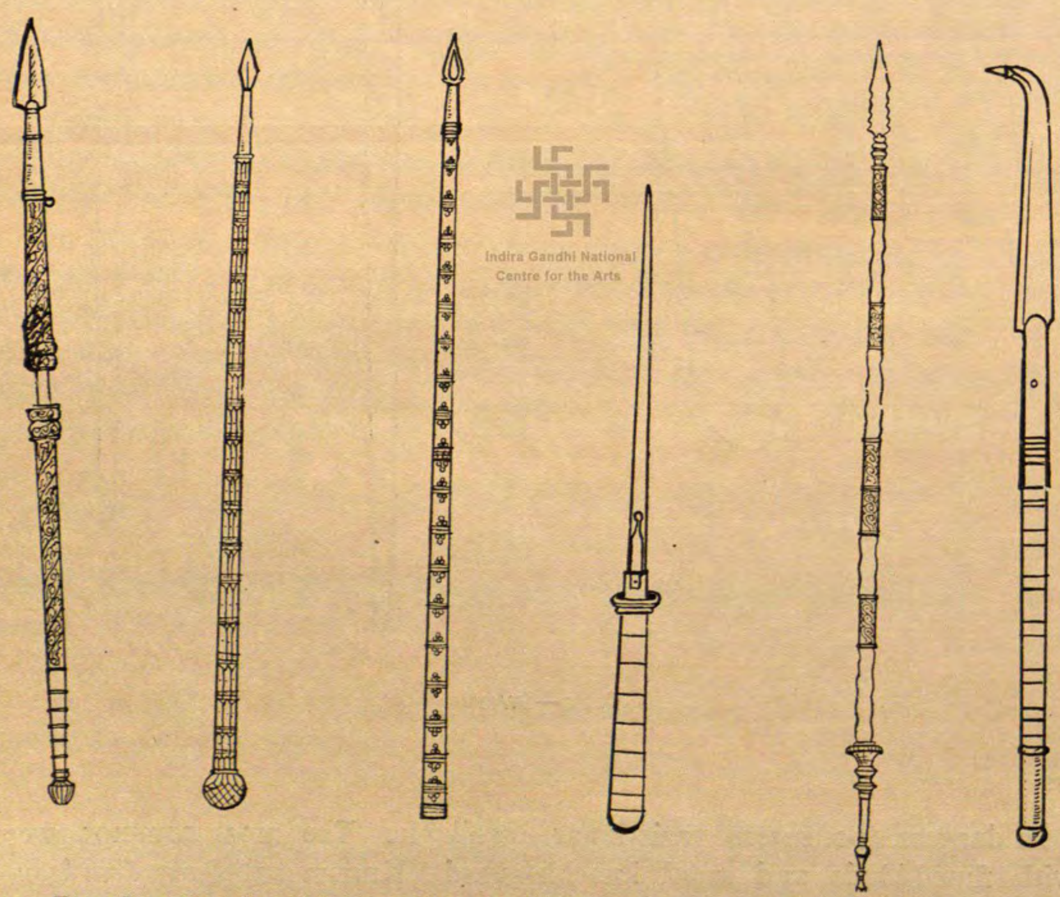
Patta—Swords

Daggers

In daggers, too, several varieties are available. The most common were the ones with fluted-blade and small knuckle-guard. Known as *Bara Jamdadu* it is simply an elongated form of *Katar*. The *Chilanum* was an adaptation of the Mughal *Khapwah*—a curved dagger having tri-pronged hilt and a globular end. The so-called

Khanjar i. e. a curved dagger with a triangle-shaped hilt was commonly used both by the Muslims and the Marathas. Double-edged dagger with "H" shaped handle was also known to them and was called *Jamadhar*. When bifurcated at the lower end it went by the name of *Jamadhar Daulicaneh* Often we find two *Jamadhars*, one within the other ; the upper one hollow forming the sheath for the other.

Katar deeply forked, groove-bladed and with damascened handle was also used by them. Frequently it has three to five portions each brought into operation with the help of springs. A special type of dagger was known as *Bichhwa* which generally had a bifurcated blade. Another special type of dagger known as *Bhid Chir* and was used to rescue a soldier when surrounded by a crowd. The National Museum, New Delhi has a beautiful specimen of this type made of horn. It shows two blades fixed in opposite directions with a grip in the centre (Pl. XLVII).



From L to R : Spear, Lance with ivory shaft, Lance with wooden shaft, Napier type spear, *Barachha* and Spear with curved blade.

The *Sainti* a proud possession, had the grip protected by a padded basket of steel from the centre of which projected a small dagger. This weapon was introduced in Spain by the Arabs and was successfully adopted by the Marathas. An example of this, belonging to the 15th century A.D., is found in "Armerian Real de Madrid."

Spears

The spearmen or the *Atekari* were personally selected by the Rajas. Later, Pindaris were also recruited in the Maratha army whose favourite weapon was the Maratha spear, twelve to eighteen feet long. These were of three types known as Javelin, *Barachha* and Spear. The first two were hurled at the enemy while the third one was used as a thrusting weapon. Generally, it consisted of a steel blade attached to the top of a wooden shaft but examples where the javelin and *Barachha* made completely of steel are not wanting. During Shahu's period spearmen used to march just behind the king. The banner *Jarri Patta* was always carried in front. Raghoba's banner was of crimson colour with gold tissue and fringes and tassels tied to the spear. The lances were popular by the name of *Aiti* As many as six hudred *Aitis* and four thousand spears were abandoned by Sivaji in 1680 A.D. The third battle of Panipat (1761 A.D.) was a cavalry-battle fought with lance and sword on Maratha side against musketry and archery of the opposing side. "Each Maratha" writes T. S. Shejwalkar, "of note had possibly a hand gun by his side but he had neither love for it nor expertness in its use. He preferred lance and spear at a short distance to the clumsy bow and arrow or heavy, long matchlocks of those days."

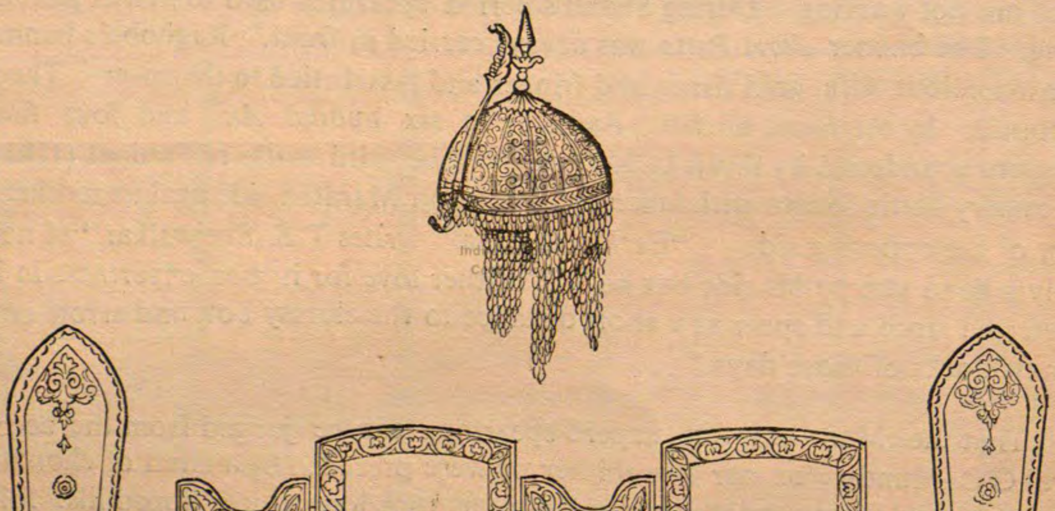
That the Marathas were superb spearmen can be judged from the account of General G.C. Mundy, "on our way thither we were preceded by a band of chosen spearmen, who played their elegant exercise before us with long lances tipped like foils with a button.'

Tiger-Claws

Tiger claw or *Baghnakh* has attained much importane in Maratha armoury. Afzal Khan was killed by it. In such a weapon five claws are attached to the pointed plates of steel, lining the palm of the hand to which the weapon is fastened by rings at the wrist and fingers. But a second variety of *Baghnakh* is also seen where five curved scythe-like blades are attached to an iron sheet flanked by two finger holes and a curved double-edged blade projecting to a side of the finger hole.[12]

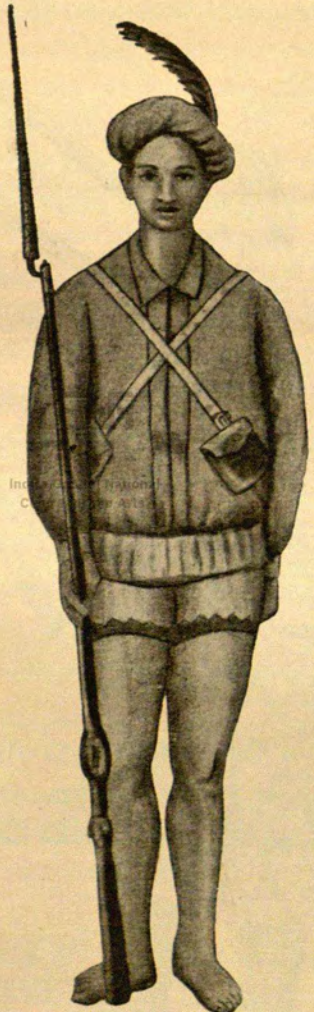
Maces

In between the king and the artillery marched the macebearers. Their mace generally had a knob on the round ball with sixteen ridges. The handle was cylindrical at either end and octagonal in the centre The second category was known as *Garj* or *Gurj*. It consisted of a pike, rectangular in section and with a globular head of seven (with varying numbers) leaves of acanthus design at the upper end of a cylindrical rod with knuckle-guard, surmounted by the tapering rod at the top. In certain cases the globular head of the mace was tipped with a quardrangular arrow-head of steel and with many steel pikes projecting from the head. It was used to strike a blow on the head. Egerton has included *Khunli-Phansi* also into this list, which had a curiously shaped head of open steel scroll work and was more akin to a *Bairagi Crutch*. Examples of maces with two globular heads, one over the other, are also found. These maces recall those found in the sculptures from Badami and Halebid. Sometimes *Gada*



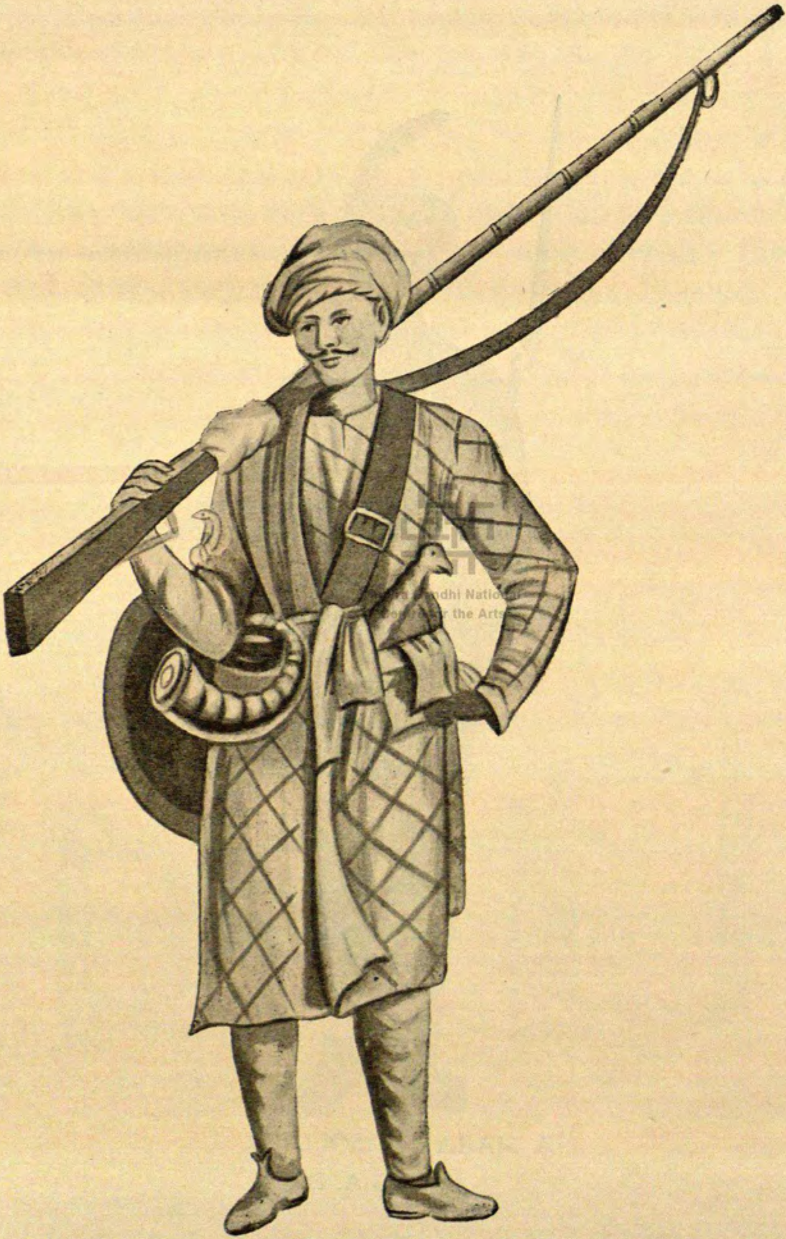
Top. Helmet
Below L. to R. Arm-Guard, *Char-aina*, arm-guard.

Plate XLV



A MARATHA SOLDIER
C. 1773 A. D.

Plate XLVI



A HINDU SOLDIER OF MARATHA ARMY

18th Century A. D.

(mace) was a heavy long barrel-like thing with a clumsy handle. Its lower end was composed of fluted shaft with a star-shaped cross-section. This type of club is painted in the early sculptures at Badami and continues in the late Chalukyan sculpture and afterwards. Persion type or the simple mace was also in common use.

Chain-Armours

Maratha soldiers did not have the elaborate and comfortable equipage of the Mughals (Pl. XLV). They were not encumbered with heavy baggage and equipment. Men wore a turban, a simple jacket and tight fitting trousers (Pl. XLVI). Officers, no doubt, were better protected with helmet and an armour of chain. The helmet was known as *Top* and was generally of Damascus steel. It was a recurved pointed cap of steel springing from a circle of conventional gilt-leaves. The front had a sliding nose-guard which extended under the chain and was flanked by a pair of *portaigreteel.*

Sometimes plume-holder was also attached at the top. In one example the top is surmounted by rectangular arrow-head of steel. The helmet is generally decorated with rich floral arabesques chiselled in low relief.

Cuirass or *Char-aina* composed of four plates of steel was used for protection of the front. Complete suit of arms consisted of steel coat-mail, pair of arm-guards of embossed steel and a cuirass or broad belt composed of stripes of steel. The *Zirh-Bakhtar* a steel skull cap from which chains hung completely of small steel rings was commonly used. In the third battle of Panipat it is said that, both Sadasivarao Bhau and Vishwasrao were fully clad from head to foot in armour.

Shield

Shield was made of rhinoceros skin. Shields of complete steel were also in use. 'As to their targets," says John Henry Gross, "they are exactly round convexing almost to a point on the outside, light and covered with so smooth and hard a varnish of lacquer that if tolerably good they will easily turn a pistol ball."[13]

Fire-Arms

The Marathas not only used firearms but also manufactured them. Captain William Gorden says, that Baji Rao had his own foundary in 1739 A.D. "I visited the foundary when I saw many coehorn and bombshells said to have been cast there and a farm of thirteen inch mortar."[14] Maratha guns were generally large and heavy. Gun carriages were clumsy beyond belief, specially the wheels were low and formed of solid pieces of wood. Locomotion of a few days usually made the carriage rickety.

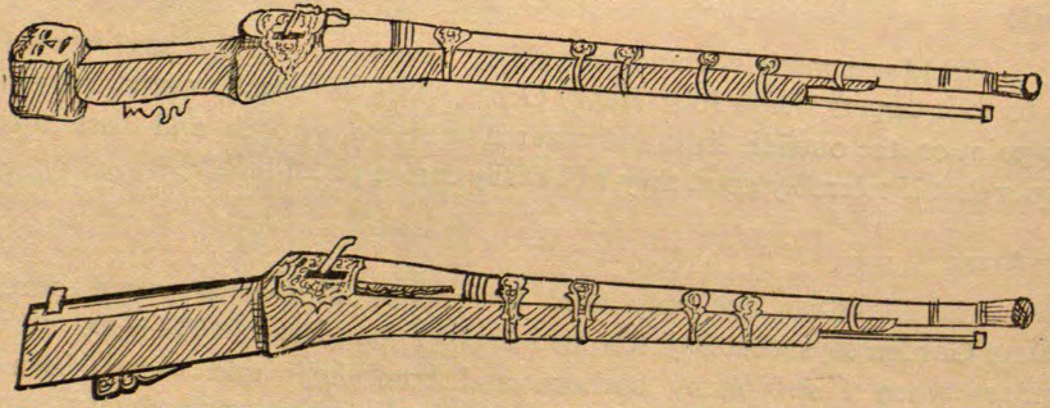
Guns were of all sorts and dimensions and were named after gods painted in a most fantastic manner.

"Cannon", says Tone, "are never made of any precise calibre but are cast indifferently by all diameters and the ball afterwards adopted to the bore."[15] Instead of cast shots they used wrought iron and could never get the precision. Maratha artillery cannot be regarded a thing to be proud of. Lieutnant Moor, an English observer writes, "A gun is loaded and the whole of the people in the battery sit down, talk and smoke for half an hour when it is fired and if it knocks up a great dust it is thought sufficient."

Marathas were quite conversant with the use of pistols and revolvers. Three to five barrelled revolvers were known to them. They used mortars too. The projectile was of the same composition as that of ordinary fireworks. Straight sword blade was also frequently fixed to the mortar.

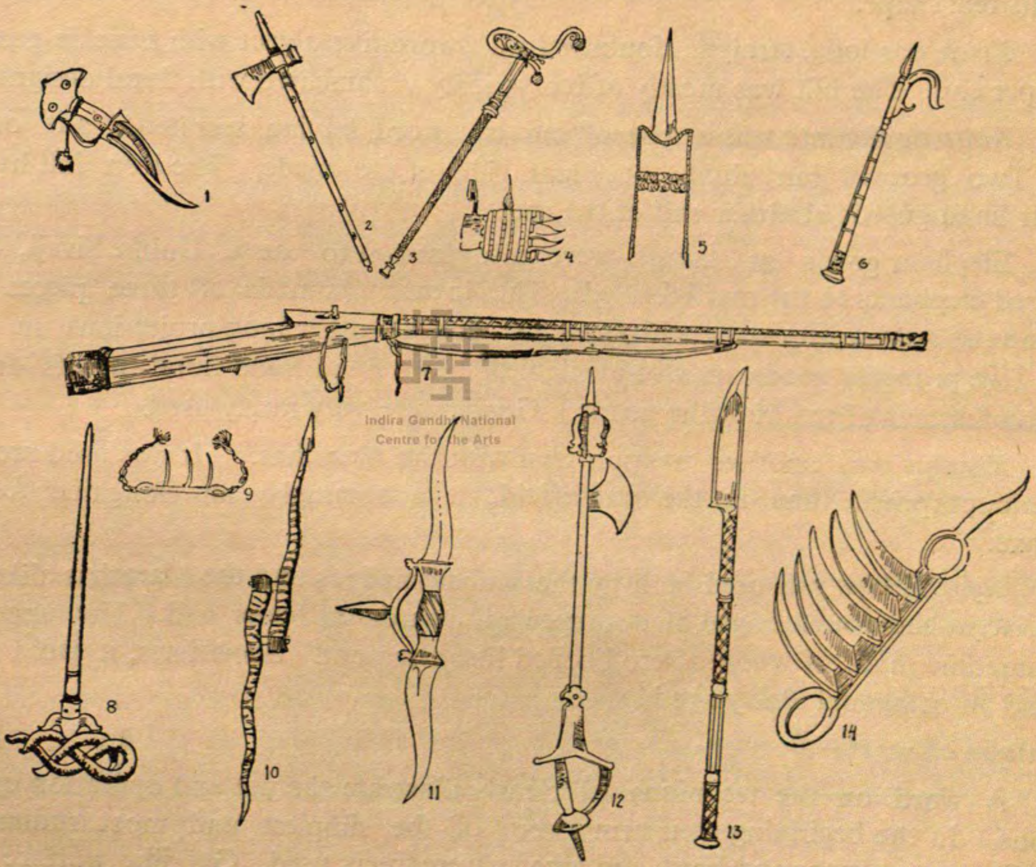
We may mention here another offensive weapon which was used by the Muslims and the Marathas alike. It was matchlock. The long barrel was usually attached with the stock by leather strips and strengthened with side plates of steel.

In fact firearms could not be fitted into the Maratha system of war. The army of the Marathas had degenerated and inefficiency and degradation set in when the traditional tactics became out of date and the European system was not efficiently grasped.



Muzzle-loading Guns

Apart from the main weapons separately discussed, the Marathas were using certain other varieties also. 'Axes' were equally popular. As many as three thousand axes were in the Maratha armoury in A.D. 1680. These were of several varieties such as 'battle axe' and prik-axe, etc. The *Pharsa* generally contained a single edged concave blade attached to a long iron handle. Examples of the double-headed *Pharsa* and *Pharsas* attached with *Gurj* are available.



1. Dagger
2. Axe
3. *Takiya Danda*
4. *Baghnakh*
5. *Jamadhar*
6. *Ankush*

7. Muzzle-loading gun
8. *Jafar Takiya*

9, 14. Tiger-claw

10. *Bhid chir*
11. *Maru*
12. *Guri*
13. *Khadga*

Misc.

Maru was another peculiar weapon of the Marathas. It was generally of two double-edged blades serrated at the end. The knuckle had a small spear-head attached to it. The central encasing of the iron hilt had curvilinear designs.

Gupti was very commonly used. Walking sticks of many designs which concealed blade inside have been found. A *Gupti* could be divided in many pieces and sometimes a knife, a pistol, and a long blade – all assembled in one place and gave *Gupti* its real shape.

Krich was long, straight, double-edged, sword-like object with knuckle-guard at the upper end. The hilt was mostly of ivory richly ornamented with floral designs.

Katta or *Karanta* was a type of curved sword having serrated blade on one side. Two grooves ran along the blunt side of the blade. The iron hilt had two circular hand guards at either end of the rod.

Elephant goads or *Ankusa* were also known to them. Unlike Sivaji, Shahu preferred elephants to the martial steed. The *Ankusa* was made of three pieces. The spike was of a thick iron sheet with one short and the other long projections on either side. Two-pronged goads are also available. Ivory handle and floral motifs are the common features of the Maratha goads. Goads were very rarely used.

Khadga was another weapon seen with the Marathas. It was used more for domestic purposes than in the battle field. It was simply an elongated form of battleaxe.

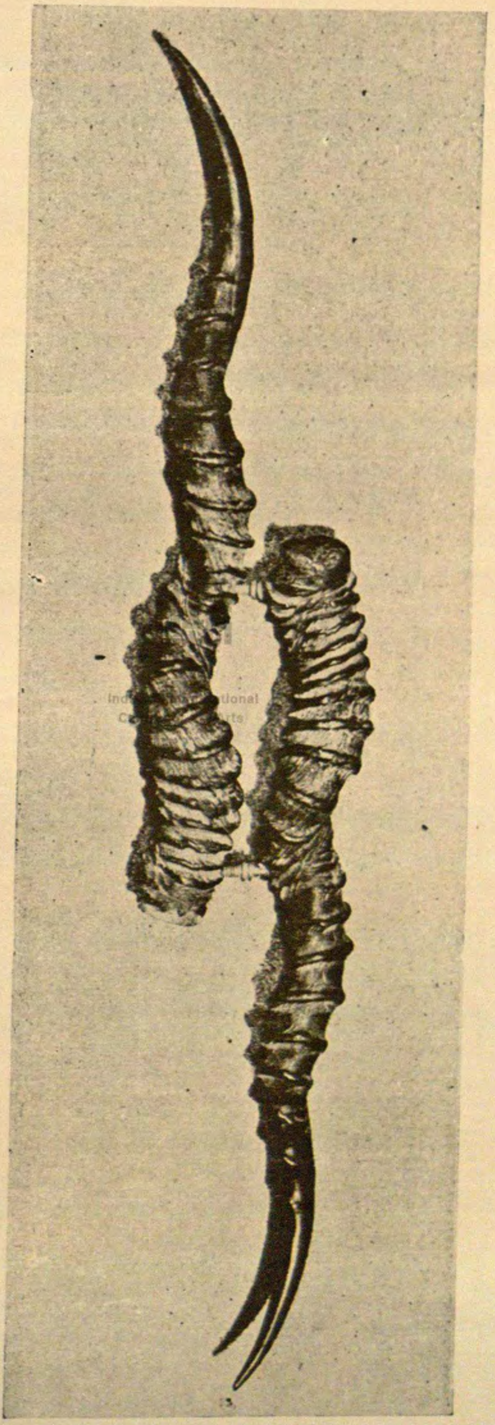
Jafar Takiya was used both by the Muhammadans and the Marathas alike. The *Jafar Takiya* had double-edged blades tapering towards the lower end. The upper end was sometime made of wooden scroll coiled like a serpent. Sometimes, it had a flower bud and an octagonal *Takiya*-rod.

Technique of warfare

A word on the technique will clearly illustrate the use and operation of these weapons. In the beginning their arms were of the simplest and most rudimentary kind. Stones, weapons and bows and arrows were freely used. Guerilla warfare was a sort of sudden attack creating a great havoc and collosal damage. In the beginning each Maratha soldier used to carry a spear in his hand and a shield to protect himself. Two swords and a few daggers were stuck to his front belt. A quiver full of arrows was at their back with the bow at the side.

When the Marathas set out for war, they cut off a handful of ear of corn with their scimitars and sprinkled their horses with blood-these acts symbolizing their life. The

Plate XLVII



MAROO OR BHIR CHIR
MARATHA, EARLY 18th Cent. A.D.

(Collection : National Museum, New Delhi.)

Maratha horsemen as well as foot-soldiers were very lightly and scantily dressed. *Pugree, lungee* and *pamree* composed their entire wardrobe. The ideal before them was "*Hindu Badsahi*" and the king assumed the title of "*Go-Brahmana-Pratipalaka.*" The heroism of Maratha soldier has been described by Pandit Kasi Raj, an eye witness of the battle in 1761 A.D., "The Marathas drank them (Durranis) like water of a river....The fighting was so violent that the earth and sky could not be seen and the eye of heaven became dazzled at beholding this spectacle."

In course of time the Maratha army was completely disorganised. "If the head remains whole, one can have eightyfive turbans to wear," became their guiding principle. Women accompanied the camp and Shahu's march seemed more a ceremonial procession than a military campaign. Camels accompanied the army. The number of these non-combatants sometimes outnumbered the fighters. They tried to copy the Europeans rather clumsily with the result that 'their arms are of the most part English and out of twenty, two will be found without lock, six without cocks and perhaps not a flint among the remaining twelve."

Prof. Sen rightly observes that a policy of aggression proves fatal if it is not provided with proper implements. So long as its army remained efficient Marathas flourished and when the army grew weak Marathas lost prominence and the end was disastrous.

References

1. Surendra Nath Sen, *The Military System of the Marathas*, 2nd ed. (1958) p. XIII (Introduction).
2. Thomas Walters, *On Yuan Chwang*, Vol. II, p. 239.
3. Vide do celebre, *Sevogy*, p. 10.
4. S N. Sen, *op. cit.*, p. XVII (Int.).
5. Fryer, *A new account of the East India and Persia.*
6. T. S. Shejwalkar, *Panipat; 1761*, p. 93.
7. Tone, *Illustration of some institutions of Maratha people*, pp. 47-8.
8. Gallery of Arms, The National Museum, New Delhi.
9. *Ibid.*
10. T. S. Shejwalkar, *op. cit.*
11. G. C. Mundy, *Mundy's pen and pencil sketches in India* (1885).
12. Maratha Showcase, Gallery of Arms, The National Museum, New Delhi.
13. John Henry Grose, *Voyage to East India*, p. 125.
14. *Forest's Selection from State Papers, Maharastra Series*, Vol. I, p. 79.
15. *Ibid.*, p. 54.
16. Moor, *A narrative of the Captain Little's Detachment.*

SĪKH WEAPONS

देह शिवा वर मोहि इहै, शुभ करमन ते कबहूं न टरौं।
न डरौं अरि सों जब जाय लरों, निसचै कर अपनी जीत करौं ॥

"O Lord, these born of Thee I ask,
Let me never shun a righteous task,
Let me be fearless when I go to battle,
Give me faith that victory will be mine,
Give me power to sing Thy praise,
And when comes the time to end my life,
Let me fall in mighty strife"

Guru Gobind Singh
in *Chandi Charitra*.

* * * *

In the 15th century the Bhakti movement in the Punjab was led by Guru Nanak. Whereas in other parts of India, Bhakti movement in due course of time was assimilated in Hinduism, this acquired a new dimension in the Punjab which resulted in the foundation of Sikhism. In the beginning of the 17th century Sikhism remained a peaceful sect but after the execution of Guru Arjan Dev by Jahangir in 1606A.D. it became militant. The young Guru Hargovind succeeded his father with two swords girded round his waist - *Peeri* and *Meeri* the former symbolising his spiritual, the latter his temporal powers. "My rosary," he declared, "shall be sword-belt and on my turban I shall bear the emblem of royalty."[1] Guru Gobind Singh's conception of God had undergone a martial metamorphosis.

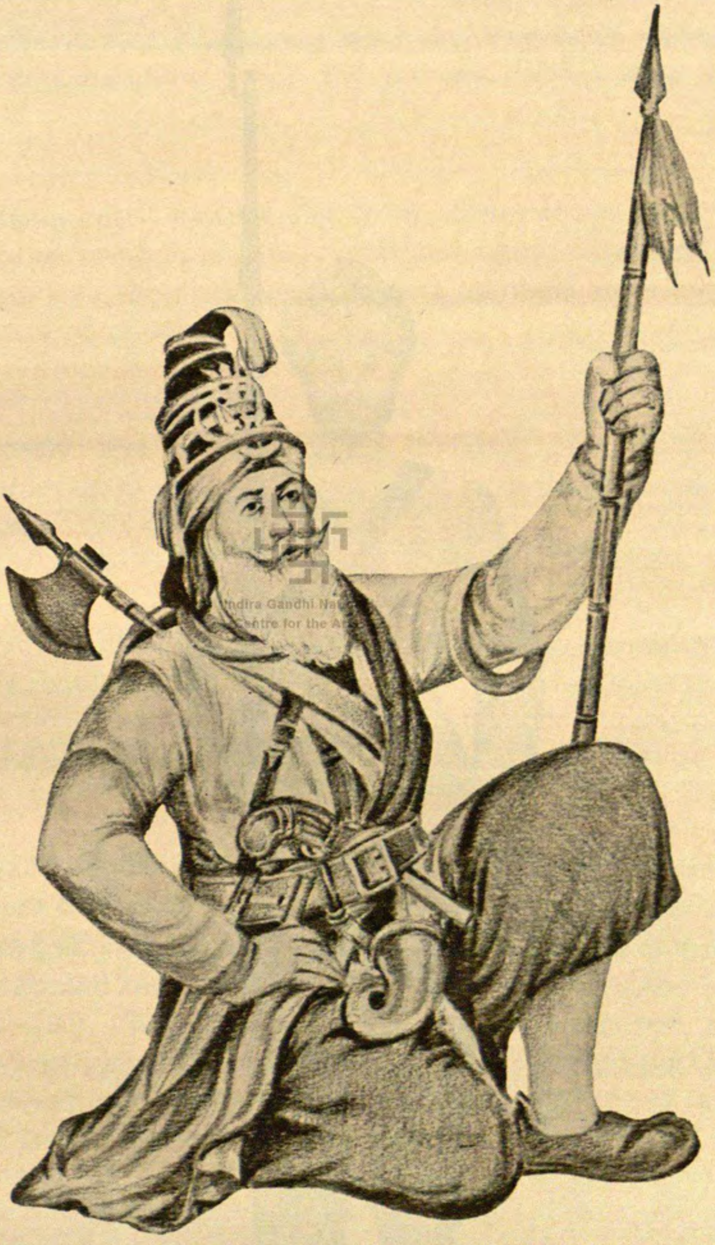
When all other means have failed, it is permissible to draw the sword. "When all avenues have been explored, all means tried, it is rightful to draw the sword out of the scabbard and wield it with your hand :"

चूंकार अज हया हीलते दर गुज़श्त ।
हलाल असत बुरदन व शमशीर दसत ॥

(*Zafar Nama*)

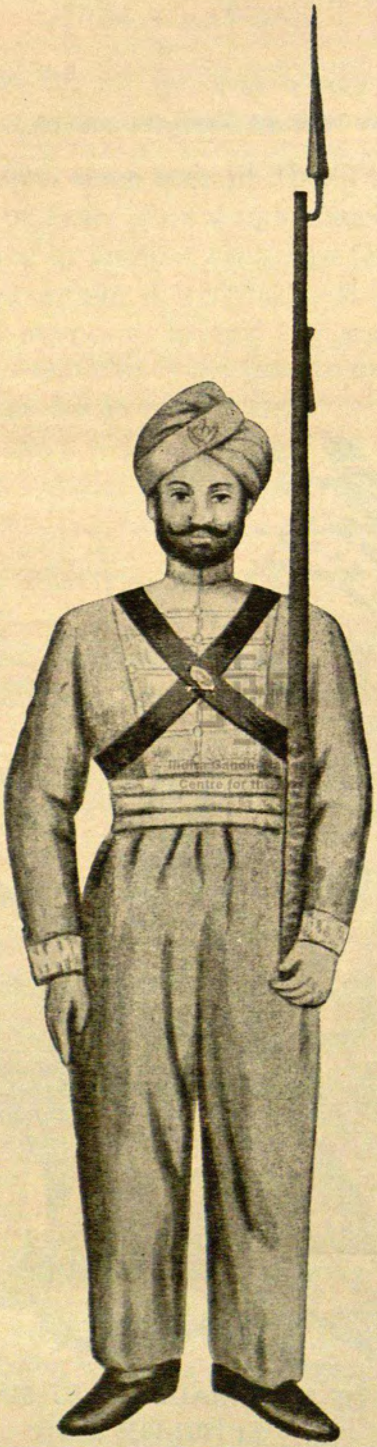
Guru Gobind Singh had destroyed the fear of Mughal despotism. Banda (1707-15 A.D.) completely broke the charm of its invincibility. From 1715 to 1799 A.D , several *Misls* (confederations) held sway practically over the whole of Punjab Ranjit Singh in 1799 A.D., found Punjab a wanning confederacy, a prey to the factions of

Plate XLVIII



A GENERAL OF MAHARAJA RANJIT SINGH'S ARMY
(1802-1839)

Plate XLIX



SEPOY OF MAHARAJA RANJIT SINGH'S ARMY
18th Cent. A. D.

petty chiefs and ready to submit to the English. He consolidated these petty states into a kingdom—a compact unit.

The Sikh military system was not based on any scientific theory of warfare. Fighting as a technique was a dismal affair. A Sikh battle was a disorderly and tumultuous show in which men fought very much as they liked, caring more for their individual gain and personal display than for mutual collaboration in the common task of winning

The Sikhs invented no new type of weapons ; they used all whatever their predecessors or contemporaries had ranging from stone-pebbles to mortars. In their weapons there is a clear fusion of several schools and styles. To them, however, goes the credit of eliminating all those weapons that were outdated and retaining only those that suited to their method of warfare.

Stones

When a fortress was besieged, stone boulders of considerable size were hurled from the rampart upon the enemy below, thus damaging and hindering their pace to a great extent.

Bow & arrow

Though the utility of bow and arrow, on account of the extensive use of fire arms, was sufficiently reduced yet it still held its place in Sikh armoury (Pl. LI). Bows were of bamboo, cane or metal and were mostly decorated and engraved with the names and sayings of the Gurus. The weapon was found specially suitable in guerilla tactics.

Sword

The sword had religious sanctity (Pl. LI). In 1699 A.D., on the eve of *Baisakhi* (a festival in the month of April) Guru Govind Singh initiated a sacred ceremony of baptism called *Khand-ka-Pahul* (the nector of the Sword). In an iron vessel the Guru put five kinds of sweets and some water, and stirred with a double-edged sword and gave to the 'five beloveds'[2]. Five new emblems were also prescribed for every *Khalsa* (pure follower) member ; sword was one of them.[3] It is said that the Guru performed a *Yajna* (sacrifice) to seek the blessings of goddess Durga and out of the sacrificial fire came a sword. The Guru then announced that the real goddess of power was the sword itself In the colophon of the drama *Vichitra Natak* the Guru has paid salutation to the sword :

'नमस्कार श्री खड्ग को करो सु हित चित लाभ'

He believed that at the time of crisis the most dependable weapon was the sword :

"या कलि मे सम काल कृपान के
भारी भुजान को भारी भरोसो"

When Paida Khan, former friend, attacked Guru Hargovind in 1628 A.D., the Guru saying "Not so but thus, is the sword used", warded off the blow and slew the man.

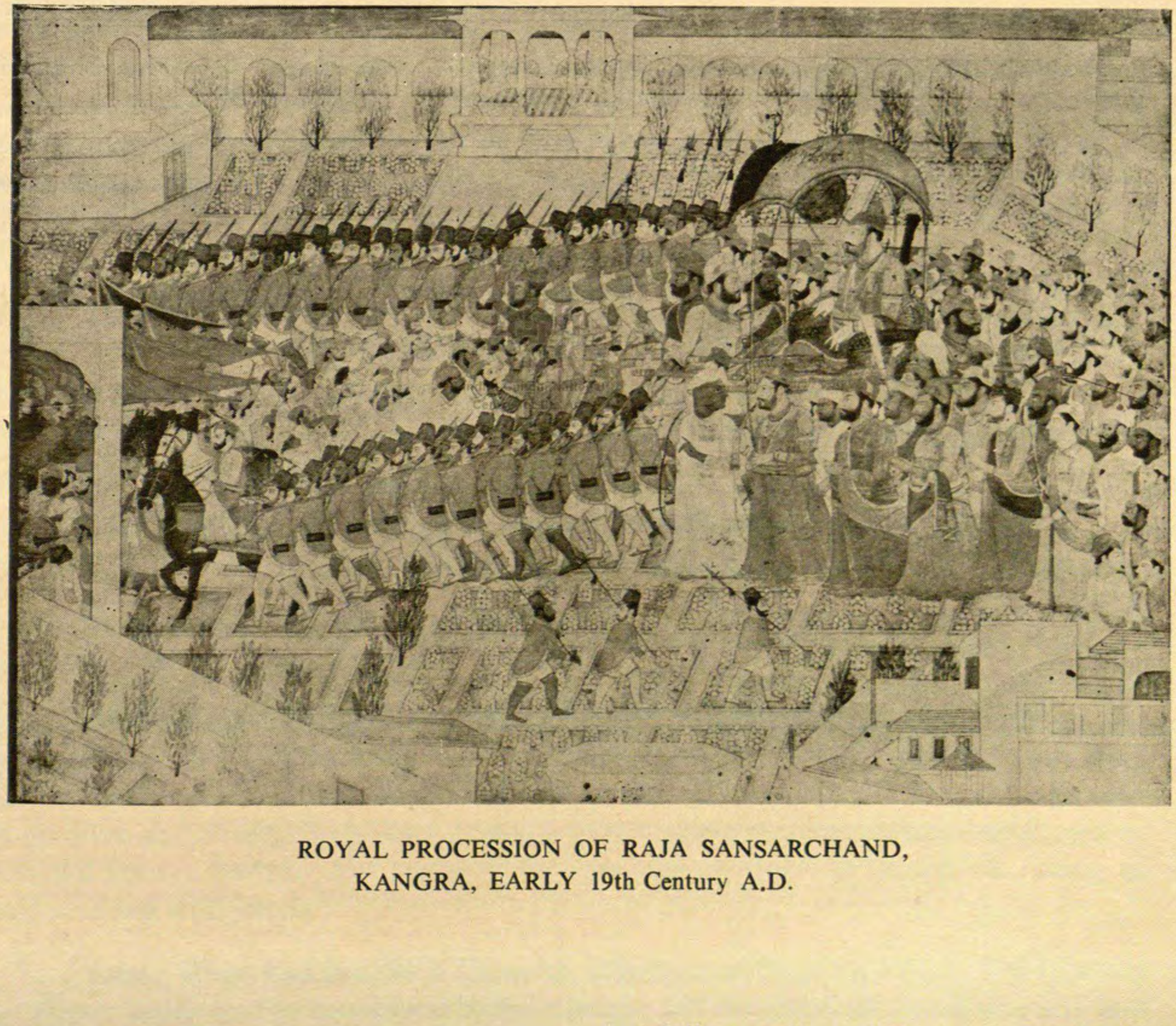
In the *Shastr Nam Mala* (the Name-string of the weapons), the names of the various weapons are recapitulated and praised. Guru Gobind terms them collectively his 'Guru or guide' :

"अस कृपाण खंडो खड्ग तुपक तबर और तीर
सैफ सरोही सैह थी, यहै हमारे पीर
तीर तुही सैथी तुही, तुही तबर तरवार
नाम तिहारो जो जपै भवै सिंध भव पार
काल तुही काली तुही, तुही तेग अरु तीर
तुही निसानी जीत की, आज तुही जगबीर"

Here five chapters have been devoted each to *Kirpana* (Sword), *Chakra* (quoits), *Pasa* (noose), *Tupak* (gun) and *Tir* (arrow). Even among these representative five, the sword ranks the first. Sword for him was not merely a piece of steel but the very incarnation of God. In the prayer he offered prior to the battle of Bhangini he addressed God thus :

Eternal God, thou art our shield,
The dagger, knife, the sword we wield,
To us protector there is given,
The timeless, deathless, Lord of Heaven,
To us all-steel's Unvanquished might,
To us all-time's resistless flight,
But chiefly Thou, protector brave,
All steel, will Thine own servant save''
(*Akal Ustat*, Tr. by MaCauliffe)[4].

As for the bravery and warlike spirit of the Sikhs, they were full of daring impetuous valour, unflinching courage, patient endurance of fatigue, high aspirations and manliness in sentiment (XLVIII). No superiority in number, no stroke, no shot, no shell could make the heart of the Sikh quail since Amrit (*Khand-ka Pahul*) gave him the moral boost to fight single-handed against millions. They could ply their swords, pliant as a cane and sharp as a razor, with perfect ease and dexterity.[5]



ROYAL PROCESSION OF RAJA SANSARCHAND,
KANGRA, EARLY 19th Century A.D.

(*Collection* : *National Museum*, *New Delhi.*)

Qazi Nur Muhammad, the bigoted author of the *Jang Namah*, who came in the train of Ahmad Shah Abdali in 1764 A.D. to fight against the Sikhs, speaks highly of their bravery. The Qazi says, "O Swordsman! if you want to learn the modes of fighting, learn from them how to face a foe like a hero and come out unscathed from the battle............When they take hold of the Indian sword in hand they gallop from Hind (Gangetic Doab) upto the country of Sindh. When they fight with a spear, they bring defeat to the army of the enemy. When they hold the spear-head upwards they break to pieces even the Caucaus Mountain...........When they bend a bow they set in it the foe-killing arrows. When they pull it up to the ear, the body of the enemy trembles like a cane. If their hatchet strikes a coat of mail, then this coat of mail itself on the body of the enemy becomes a shroud.........Besides these arms when they take up a musket in hand at the time of battle, they come to the field fiercely springing and roaring like lion and immediately split many a breasts and make the blood of many others roll in dust.........Though guns are possessed in large numbers by others, yet nobody knows them better. These bad-tempered people discharge hundreds of bullets on the enemy on the right and left and in front and on the back."[6]

Banda Bahadur's sword created panic. The sight of one Sikh swordsman was enough to terrorise a whole village. The name of Banda had become a source of inspiration to the Sikhs. He was reputed to be able to deflect a bullet from its course and work such spells that neither spear nor sword could injure his men.[7] His coins bore the following inscription:

'देग ओ तेग ओ फतेह् ओ नुसरत-ये-वेदरंग
यफ्त अज नानक गुरु गोविन्दसिंह्'

'Through the hospitality and the sword to Unending Victory granted by Nanak and Guru Gobind Singh'.

The sword which carried the glory of the *Khalsa* was forged by Gobind, the steel was provided by Nanak who in turn had obtained it from the Hindu ores, and wielded by Banda. The sword continued to be used till the last and its lustre was seen in the First and Second Sikh Wars. It was a coveted present. Ranjit Singh presented to Allard a Persian Sword. For the blade the Maharaja paid Rs. 5,000, the hilt being of gold studded with jewels.[8]

Baron Hugel had in 1836 A.D., in his collection of Punjab a terrible sabre known as *Hatta* which had to be wielded by both hands. But this kind of sword was rare and was a curio rather than a weapon of war.[9]

The most common varietv of swords was the *Talwar* which was both straight and slightly curved. The straight ones were double-edged and the curved ones were either single-edged throughout or single-edged at the beginning and double-edged towards the lower end. *Khanda* was very broad and its hilt generally had a knuckle-guard. *Khang* was a small sword which was kept without a sheath and was hung round the shoulder. *Kirch* was very long, straight and thin, like the European infantry swords. The Sikh artillery men used the *Kirch* for thrusting purposes. The Sikh sword-hilts were smaller but were more effective than that of the English ; the two Anglo-Sikh wars bore testimony to this.[10] "The swords of Sikh nobility were very costly, because their blades, handles, guards and scabbards were tastefully decorated with gold and jewels.'"[11] Henry Fane tells us, "the blades of Ranjit Singh's swords alone were in some instances valued at 1000 pounds and the gold and jewels upon their hilts and scabbards at five times that sum."[12] Long *Patta* swords of the Marathas were equally popular with the Sikhs. Their scabbards were made of thin strips of *Sembal* wood and covered with cotton, velvet, *kimkhab* or leather. These were carried through a belt of leather and hung round the waist.

Lances

The lances were used mostly by the cavalry (Pl. XLVIII and Pl. LIII). These were long shafts of steel or bamboo to which were fixed sharp pointed steel blades Their length varied between 10 and 15 feet.[13] Some of them were studded with gold. The spears were not popular as these could not be hurled. *Barachhas*, completely of steel were highly favoured for they were very light, long and pointed.

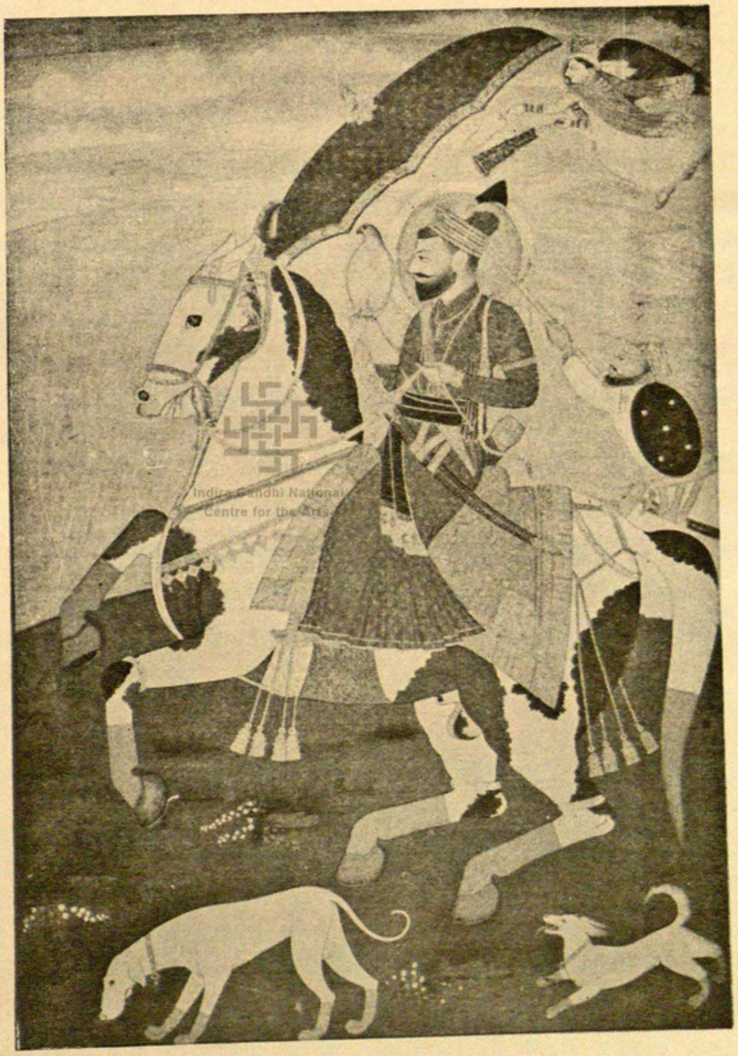
Other edged weapons

Other edged weapons used by them were *Jamadhar*, *Peshqabj*, *Katar* (of the Mughals), *Khapwah*, *Jambuwah*, *Jaghnol* and *Chuga* (of the Rajputs), *Chhura*, *Bichhwa*, *Bhid Chir*, *Baghnakh* and *Jafar Takiya* (of the Marathas) and the napier of the Europeans (Pl. LII). Bone, ivory and metal were commonly used for hilts.[14] The handle of the *Peshquabj* was usually of *Shirmalu*, the white bone of a large caticean. The sheath, whether of leather or velvet, was long enough to cover a part of the handle of the dagger. Precious stones, jade, agate, rock crystal, etc., were used as studs. The blades were often beautifully inlaid with gold.

Chakra

Chakra (Quoit) was the universal weapon of the Sikhs ; most favoured by the *Nihangs* or *Akalis* who carried it as a part of their dress and accoutrements (Pl. LII Top and also Pl. LIII). In some of the paintings the Sikh warriors have been depicted

Plate LI



EQUESTRIAN PORTRAIT OF GURU GOVIND SINGH JI,
GULER, C. 1810 A.D.

wearing it upon their turban. The name must have been derived from the mythical *Sudarshan Chakra* of Vishnu. "A quoit consisted of large thin circle of steel, six to eight inches in diameter, the outer edge being very sharp. It was thrown by rotating by means of a finger and could be effective at a great distance, about sixty to hundred yards."[15] Two varieties have been noticed; *Chakkar Sada* was plain, having sharp and smooth edge and *Chakkar Katavdar* consisted of serrated outer edge The whirling of this weapon required a great skill and accuracy. The Sikh warriors had mastered its techniques and very successfully used it in some of their battles.

Defensive-Armour

"The accoutrement of a Sikh soldier, while on march, consisted of offensive and defensive weapons, priming horns, ammunition pounches, two blankets, a grain bag and heel ropes, while their cooking utensils were carried on ponies. Swords, spears, scymetar, sabre, two-edged daggers, lances, muskets, guns, cutlasses, pikes, bows and arrows were generally employed. In handling these arms especially the matchlock and the sabre, they were uncommonly expert"[16]. There was no uniformity in their dress. Some wore a shirt of mail with a helmet inlaid with gold, others were gay with the many coloured dress of velvet and silk, with pink or yellow muslin turbans and gold embroidered belts carrying their swords and powder horns. All bore, at the back, a shield. The Sikhs on their part were not troubled about bullets, shells and balls than if they had been mosquitoes, flies or bees."[17] Defensive armour of all kinds were much prized and much taste and ingenuity was expended on their adornment. Helmets were used for the protection of the head while plates of steel for back, breast, arms, waist, legs and other organs of the body.

Helmet

It was also called *Top* (hat) on *Khods*. This was hollow from inside, with a nose-guard or vizor. These were surmounted by small steel shafts, in the centre of the outer side, to hold plumes of white horse hair or feathers from Kashmir herons. The nose guard of a thin, flat steel rod, triangular at both ends, was attached on the front side through a steel hook. It was sliding and could be raised up or down at the will of the user. Helmets made of many steel plates hinged together with iron chains were also used. The outer surface was beautifully engraved with inscription and other geometrical designs. The lower edges alround were decorated with floral pattern in golden colour.

On all the three sides a curtain of interlinked small chains was attached to the helmet for the protection of the neck and two ears. Sometimes, small metal plates were also attached to cover the neck and a portion of the shoulder. It was called *Zirikullah* (cap of mail). These helmets were used by high officials ; for ordinary soldiers flat, round or rectangular skull caps surrounded by chain armours were provided.[18]

Inside these helmets cotton pads covered velvet or *Kimkhab* were fixed. Sometimes, these pads were long enough to protect the neck and the ears also.

Body Armour

These were for the protection of the front and back and were either completely of chains, i.e. of small iron rings hinged together or of plates. Two, four or even more square, rectangular or oval plates were attached to the chain. The most popular one was *Chahar-aina* (four mirrors), i.e. chain armour fitted with four square metal plates in the front.[19] Sometimes, the chain armour was used beneath the plate armours.

These plates were both fixed and detachable. Instances are not rare where the armour was entirely of metal and of one solid block. As it was very heavy and did not allow free movement it was not very popular. These coats of mail were generally without sleeves and reached upto the waist of the wearer but full sleeven tunics and long enough to cover the knee were also prevalent. The chain armour was called *Kurta Zira.*

The plates of the armour or at least its borders were beautifully damascened with inlaid gold work. It was called *Koft* (Sorrow) as the work was a mere imitation of the famous Mughal true damascening (*Tah Nishan*). The inner side of the armour was padded with cotton or velvet.

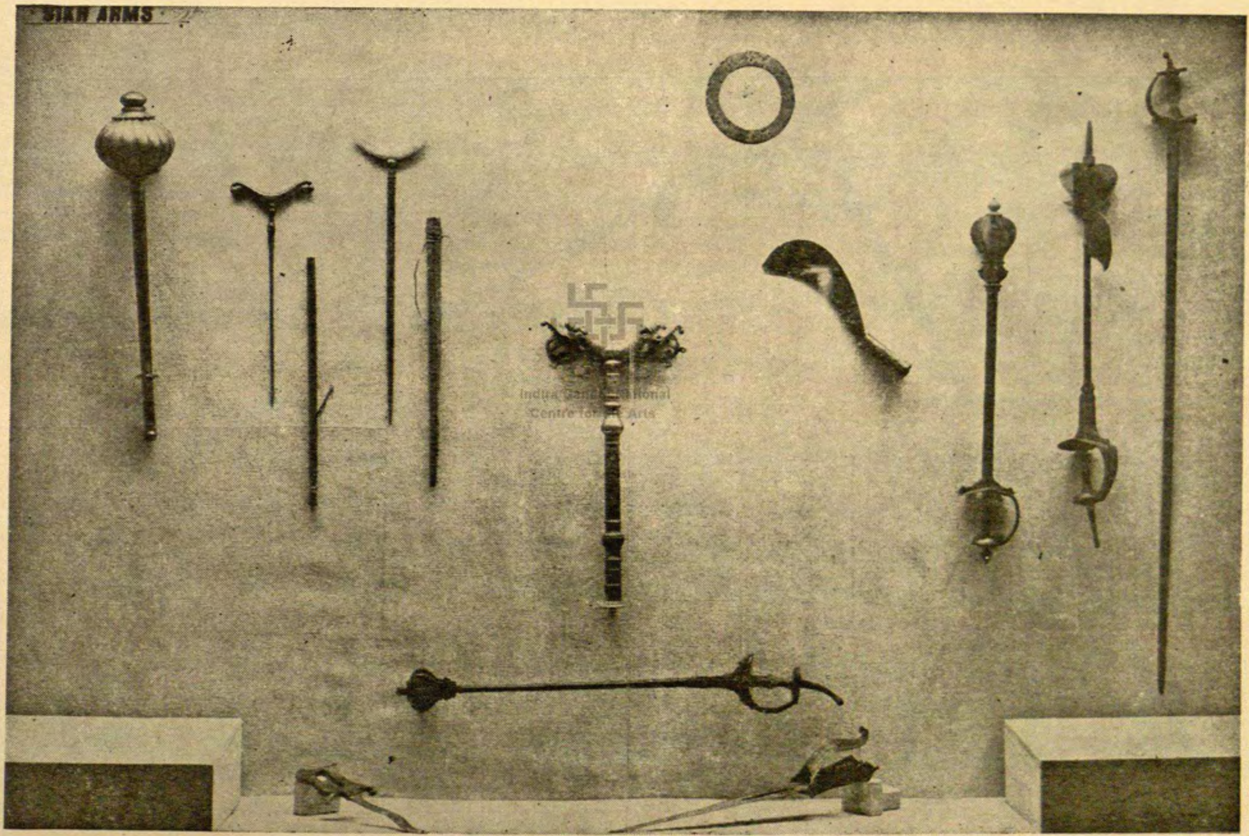
Hand Armour

In case of sleeveless tunic, the hands were protected with small round plates made to suit the hands. It was made of two separate curved plates joined together with small leather straps and buckles. A small chained armour piece padded with velvet lining was attached to it to protect the fingers and also to allow a free movement. Sometimes, there was a hole for the thumb to be taken out to facilitate handling of the weapon. The upper portion of the arm was protected by the shoulder pads of velvet or cotton studded with small nails.

Trousers

Trousers, invariably of small iron rings joined togeth er, were worn by the soldiers. These were called *Pyjama Zira.* A pair of oval shaped ringed armour with a big hole was meant for the toe. It rested comfortably upon the shoe.

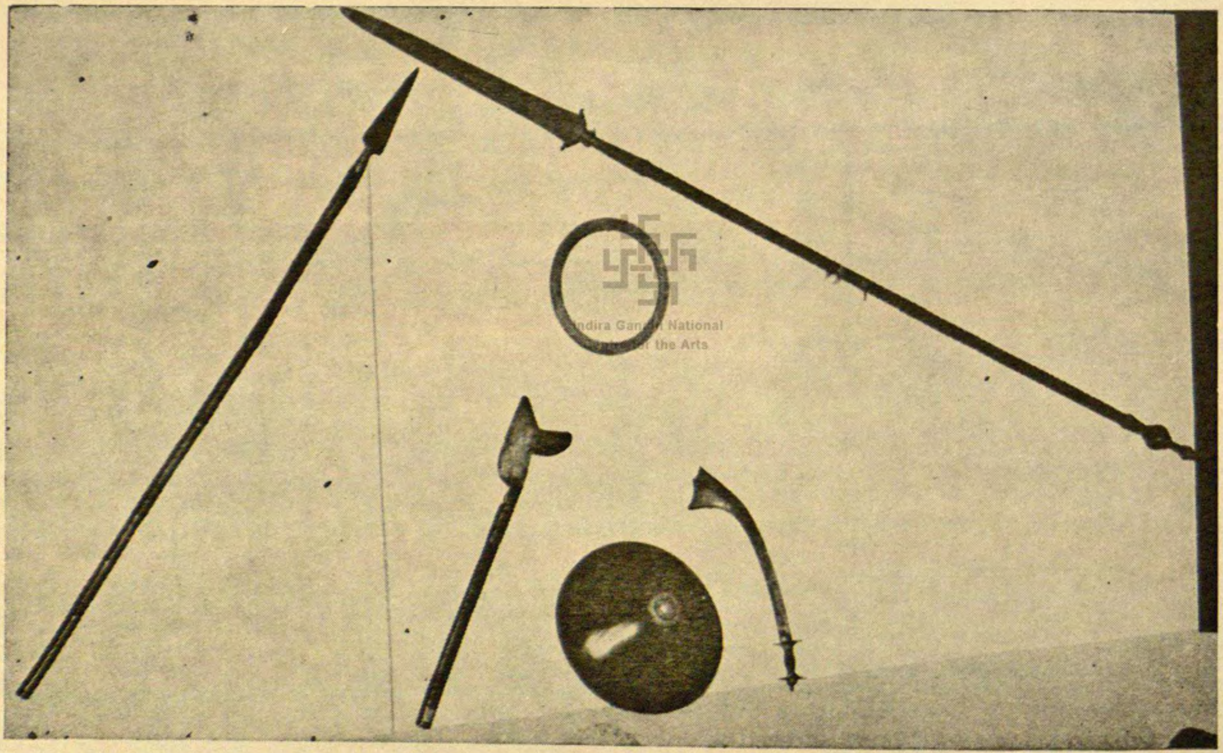
Plate LII



SIKH ARMS,
17th-18th Cent. A. D.

(*Collection* : *National Museum, New Delhi.*)

Plate LIII



SACRED WEAPONS OF GURU GOVIND SINGH JI,
C. 1675 - 1708 A. D.

Most of the chain work was rather coarse though cases of fine and skilful workmanship were not unknown either. All the armour, although strong and capable of resisting a sword cut or a spear-thrust was very light, the steel being of finest temper and quality. It may be recorded here that during Maharaja Ranjit Singh period there were hundreds of French cuirass in vogue in the army which had been imported by Allard from France.

Foot Armour

An oval-shaped chain armour, padded with velvet, was used to protect the feet. It rested upon the shoes in such a way that it allowed a free movement and gave full protection.

Shields

The shields were an indispensible item carried by Sikh warrior (Pl.L). When not engaged in war it was slung across the back. These were generally of *Gainda* (rhinoceros) hide or of buffalo hide. Stray examples of crocodile skin are also available. These were lacquered and painted with hunting scenes. The metal shields were studded with four or more gilt bosses on the convex side. These were damascened either with true damascening or *koft*. The damascened shields of Gujarat and Sialkot were much in demand.

The shields were mostly circular about 20 inches in diameter ; but the size varied. A small cotton pad with two leather straps was fitted inside for holding in position.

Gun powder flasks

Several varieties of powder flasks were used by them. The materials employed in making them were silver, steel, mother of pearls, wood or leather. These are finely engraved with war or hunting scenes They were in various shapes and designs ; mute witnesses to aesthetic sense of these warriors. Ammunition pouches of leather were also carried.

Girdles

Girdles of leather, padded with *Kimkhob* and embroidered, were worn round the waist to hold swords, powder flasks, pouches, etc. *Churras* were slipped into them.

Fire Arms

In the beginning artillery as a part of armoury was of a very limited consideration. The Gurus could hardly afford to collect more than a few guns. The

Misaldars were fond of having as impressive a park of guns as possible but these pieces were more for show than for use. They made more noise than harm. They could not be fired repeatedly and were liable to burst and kill the men incharge. The art of forging guns was not much advanced and all European observers like De La Flotte, Fitzeclarence and Cambridge[20] are one in their opinion that Indian guns in the 18th century were not founded, but built up of iron bars bound together and held in place from distance to distance by thick rings of the same metal. Like Mughals, they also depended upon the foreigners to a large extent for the supply of their fire arms. Colonel Hector Munro, the victor of the battle of Buxar, speaking of the period 1763-1772 A.D., held that Indian princes got their artillery from England, Holland and France. "There is hardly a ship that comes to India that does not sell them cannon and small arms, the most of the gunpowder they make themselves. They cast shot in abundance, but there is no black prince that casts cannon and military stores are smuggled into the country."[21] The carriages of these guns were clumsy and of primitive construction. According to Forster, "the artillery of the Sikhs was awkwardly managed and its use ill-understood."[22] The result was that they, in their initial stages, could not stand against any artillery and a few field pieces were sufficient to keep in-check their many soldiers.[23]

It was Maharaja Ranjit Singh who should be credited for the complete overhauling and organizing it on the European pattern (Pl. XLIX). He had a craze for guns. Metcalfe says, "the Raja's attachment to his guns and his opinion of their weight, are both so great that he would never miss an opportunity of obtaining a gun. If he learns that there is any gun in any fort, he cannot rest until the gun has been given to him to save the fort. He immediately dismounts the gun and drags it after him as an addition to his field train."[24] In 1805 A.D. he attacked Amritsar, which was in the possession of Mai Sukkhan, to get the reputed *Zamzama* cannon.[25] During 1799-1808A D. the total number of his guns of all calibres has been estimated between 35 and 40. They included brass and iron guns and were five pounders, six-pounders, twelve pounders and few heavier guns. Most of them were country-made. One of them was an English twelve-pounder and a Dutch five-pounder of brass. In 1807 A.D. he established some factories at Lahore and elsewhere for the manufacture and repairs of guns.[26] Though the guns produced here were neither of good quality nor of accurate bore but it is consoling that at least an effort had been made in the right direction. The same year he established two separate departments known as *Topkhana* (heavy guns) and *Topkhana Khurd* (light guns).[27] The carriages were made of three wheels (one wheel was fixed in the track) and were without limbers. These were tolerably good and made of seasoned *Sisoo* wood.[28] For these carpenters were invited from Delhi. Another foundry was established at Amritsar. Apart from gun-powder it also produced fuses which were of wood and very crude.

By 1808 A.D. Ranjit had acquired about 100 *Shutarnals* (Swivels) and had opened a third department called *Daroga-i-Zamburkhana* (Superintendent of Swivels) There was no horse-artillery uptil now. The guns were drawn by the buffaloes. Forty to fifty buffaloes were needed to drag one heavy gun-carriage. On 22nd December, 1810 horse-artillery was created. On this day Gopal Singh Zamadar brought two pieces of cannon drawn by the horses and the Maharaja was so much impressed that he immediately ordered a separate branch for it,[29] and in 1811 A.D. it started functioning under Mir Mazher Ali Beg In 1813 A.D. twelve more pieces were acquired and the workshops of Lahore, Amritsar and Kotli Lorahan were expanded. At this time thirty workmen and thirty gunners were invited from Delhi for making good guns on the English pattern. It was in this year that a new weapon called *Gubarah* (mortar) was produced. The first results were not successful but later on these were produced in vast quantity and of quite a good quality and used as field guns.[30] In 1821 A.D. the Maharaja had 200 guns and 200 *Zamburakas.* In 1823 A.D., sixty-four more guns from the various forts captured by him were added. By that time there were five *derahs* (battalions) for the cannons and three for the *Zamburaks*. Sohan Lal[31] gives the following description of these *derahs :*

Cannons

1. Derah Ilahi Baksh, 15 guns, 395 men, Rs. 2931 p.m.
2. Derah Mazhar Ali Beg, 6 guns, 159 men, Rs. 1140 p.m.

Zamburkhana

1. Derah Ibadullah Khan, 205 men, Rs. 1800 p.m.
2. Derah Ghulam Mohammad Khan, 55 men, Rs. 334 p.m.

In 1831 A.D. the Maharaja had 376 cannons and 370 *Jinjals* (a type of Swivel).[32] This year the Maharaja invited Court and Avatabile specially for the modification of artillery Now the departments of artillery were reorganised afresh, i.e. (a) *Topkhana Jinsi* (mixed batteries) comprising of *Aspi* (horse-driven), *Gavai* (bullocks-driven), *Phili* (elephants-driven), *Shutari* (camels-driven) and *Habath* guns (from French *Hobit* or English howitzer), (b) *Topkhana Aspi* (horse batteries), and (c) *Zamburkhana* (Swivel batteries). Apart from these three, a separate *Topkhana* was established for the exclusive use of the Maharaja called *Topkhana-i-Mubarak* or *Topkhana-i-Khas* which was further sub-divided into *Topkhana Kalan* (heavy guns) and *Topkhana Khurd* (light guns). Field guns were placed under Syed Imam Shah.[33] Court and Avitabile, being experts made several innovations in the arsenal and foundries and the next year a very much impressed Captain Burne says, "The guns were well cast and the carriages in good repair : they had been made in Lahore and cost him (Ranjit Singh) Rs. 1000 each."[34]

In 1838-39 A.D. there were 192 guns in the royal armoury, 100 guns positioned in different forts of Lahore Kingdom and several such guns possessed by the jagirdars under the Maharaja. The number of *Zamburaks* rose to 500. McGregor had personally seen 500 camels armed with swivels on the occasion of Dussehra Parade.[35] Lieut. William Barr has referred to several *Bharmar* guns (long duck-like guns) which formed part of the Maharaja's artillery.[36] In 1839 A.D. about 4490 persons were working in the artillery department and their monthly salary was Rs. 33,346.

Ranjit Singh was not contented with the material produced within the kingdom only. He was always in the look out for importing foreign made artillery pieces also. In 1835 A.D. he sent a mission to Calcutta to purchase 1100 muskets and 500 pistols which he was allowed to buy from the Delhi Magazine. In 1836 A.D. Allard acquired for him Rs. 40,000 worth of arms and other articles from France. These included 400 curras, 1800 fuzils, 600 pairs of pistols, 2 million detonating caps, a model paste for artillery, etc.[37] In due course the artillery-strength of the Maharaja was almost at par with that of the East India Company. This has been confirmed by Henry Fane, "Court has brought his artillery and musketry to great perfection, the latter being quite as good as those of the Company with the advantage of being lighter."[38] In the same year Macnaughten and Obborne, after examining the Sikh artillery and bombardment of Dinanagar, proclaimed that there was no difference between it and that of the British except that the quality of gun-powder was a little inferior since it was produced in the Indian factories ; the Indians did not know all the technical details known in Europe that time[39]. The gun-carriages were improved. Old and worn out guns were recast. Accurate calibres were achieved. Baron Hugel had himself seen the guns produced at Lahore which could be compared with any other gun produced all over the world[40]. "Even most significant improvements were effected in ammunition. The latest innovations spherical cases and iron sharpnels were adopted.[41]" In 1833A.D. Court introduced 'fuze' for which he was rewarded Rs. 5000.

Even after the death of the Maharaja in 1839 A.D. when deterioration set in the Sikh army, the position of the artillery was still better. A huge Supply Depot was established at Bussean, between Ferozepur and Ambala. The following table indicates its growth under the various administrators:[42]

Year	Reign	Number of employees	Guns	Pay yearly
1839	Maharaja Ranjit Singh	29168	192	Rs. 382088
1840-43	Maharaja Sher Singh	50065	232	Rs. 548603
1844	Raja Hira Singh	50805	282	Rs. 682984
1845	Sardar Jawahar Singh	72370	381	Rs. 852696

The table does not include the garrison guns as also the artillery pieces under the jagirdars If all are included, there would be 584 camel swivels, 308 field guns, 104 garrison guns and many other pieces ; all inclusive the total would be 10968. However, this increased artillery proved more harmful than useful. It resulted in the fiscal breakdown and the disintegration of the Khalsa state.

The following different categories of fire-arms were used during the Sikh rule.

Matchlock

It consisted of a long barrel of wrought iron which was attached to a wooden belt and wrapped with metal bands (Pl.L.). It was fired by a *Fatila* (slow light match). The priming powder was loaded in the barrel with the help of the muzzle loading rod. This rod was always carried with the matchlock. A trigger, well drawn, brought the *Fatila* into contact with the priming powder in the flash pan and the gun was fired.[43] It was known as *Bandook Toradar*. The name has been derived from the *Taur* or *Tor*, the elephant creeper, the fibre stalks of which were for slow matches after drying[44]. *Fatilas* were prepared from the hanging roots of the *Pipal* (*Ficus Religiosa*) and the *Bar* (*Ficus Indica*) trees. The Sikhs had borrowed this weapon from the Mughals. In the 17th century this weapon was in common use. In the early Sikh warfare these matchlocks created havoc. "Their matchlock", says H.R. Gupta, "strikes a man at a distance of nine hundred paces and each of them covers two hundred *Kos* (one Kos = 2 miles) on horseback clearly enough had it not been so how would have they succeeded in opposing the *Vilayati* (company) troops ? After all Durrani army also admitted it".[45] These were specially liked by the foreigners and Jacquemont has spoken highly of them.[46]

Flintlock

It was purely a European copy of the 'Snaphaunce'. In Europe it was known quite early and it reached India in the late 16th century but could replace the matchlocks and the wheel-lock only in the 18th century. It was commonly known as 'Brown Bess' and was used by the infantry. The Sikhs were the first Indians to realise its importance and use it on a large scale. It was a long-barrelled piece, firing with flint and pan. It was locally called *Bandook Pathar Kala* or *Bandook Chaqmaq.* "It carried no lighted match, but had a self-contained ignition mechanism. There was a hammer, which striking on a piece of flint, produced a spark which ignited the priming powder in the pan and caused the discharge."[47] It has sometimes been wrongly called a "musket" but the term musket was common for all the arms fired from the shoulder. It could equally be applicable both for matchlocks and flintlocks. Pollard informs us that originally the term musket (meaning young male sparrow-hawk) was used for every heavy matchlock or the wall piece type, which was fired from some rest. Since it was the smallest variety of a cannon it was called musket on account of the bird being smallest of all hawks. Later on it became common for all the shoulder stocked fire locks.[48] *Sangins* (bayonets) were attached to the fore-part of the barrel. Lord Gough has praised these flintlocks and placed them on par with those of the British.[49]

The barrels of the flintlock as well as of the matchlock were covered with elaborate damascened work, and the stock adorned with embossed metal-work or with various designs either in lacquer or painting or inlaying of different materials These stocks were sometimes decorated with embossed and engraved mounts in gold. The butt had generally an ivory or ebony cap. The bands used for attaching the barrel with the stock were of gold, silver, brass or steel and were sometimes of perforated design and were chased.[50]

Jazail

Also called *Jazair* was a wall-piece or a swivel gun. Steingass defines it as "a large musket, wall-piece, swivel, a rifle used with a prong or rest."[51] Its usual length was eight feet. Lake says that '*Ginjal*' was the same as *Jazair* or *Jazail* and these were "long matchlocks, of various calibres used as wall-pieces by the natives of India, which are commonly fixed like swivels, and carry iron balls not exceeding a pound in weight. In the field they are sometimes carried on the backs of camels"[52] The word seems to have been derived from a local Hindi word *Janjal* (trouble). These were found specially suitable for the protection of the forts. Thomas Williamson informs us that these guns carried a ball from one to three ounces in weight, and having very substantial barrels, were too heavy to use without a rest. Many had an iron prong of about one foot, fixed on a pivot, and thus placed on a wall, a bush or ground served as a support. Another variant was *Ghordahan* (wide mouth) where the mouth of the barrel was comparatively wider. One thousand such *Ghordahans* were made at Lahore between 1748-1754 A.D. for Muin-ul-Mulk.[53]

Bharmar

It combined the slow-match and flint technique. It was invented by Mirza Bharmer of Ranjit Singh's army and hence the name.[54] It was more dependable and was preferred to matchlocks and flintlocks. In all other respects it was the same as the musket.

Carbine

It was a short fire-arm also called as 'blunderbuss'. Its barrel was generally three feet long with a slightly trumpet-shaped mouth. Being light these were preferred by the cavalries. It was introduced by Ventura in the Sikh army who in 1840 A.D. had imported 200 such carbines. These were also called 'Dragoons' which were short pieces of 16 inches-barrel and full musket bore with fire locks or *Snaphaunces*.[55]"

Percussion cap Gun

It was superior to the flint-lock as it was fired by means of a detonator i. e. a cap containing an explosive composition.[56] It was locally called *Bandook Masaladar.* It was introduced in the Sikh Army in 1825 A D. and soon Ranjit Singh was convinced of its utility and had imported two million detonating caps in 1836 A.D. Had the Maharaja survived he would have replaced all the fire-locks to the percussion cap system.[57]

Pistol

It was called *Tamanchah* or *Tameanchah* (lit. a sharp blow). This was introduced in India in the early 18th century. In the beginning it was confined to the higher ranks of people. The Sikh pistols were patterned after the highly developed British pistols. Ranjit Singh once imported 500 pairs from France and again purchased 500 pieces from the East India Company[58].

Sherbacha

This musketoon or blunderbuss (lit. tiger-cub) was introduced after the pistol. Probably it came into India with Nadir Shah's army in 1738 A.D or that of Ahmad Shah Abdali (1738-1761 A D.). It has been recorded that in 1760 A.D. Ahmad Shah came with ten thousand men having *Sherbachas* of *Kabul*.[59] It was a mountain-gun used by the Sikhs. Its barrel was shorter than that of a carbine but its mouth was wider and truly trumpet-shaped.[60]

Double barrelled Gun

It was a flint-lock having two short barrels. It was presented to the Maharaja by a British regiment and thereafter he ordered its manufacture at Lahore foundry.

One such gun manufactured in the hills was presented to Jacquemont by Raja Gulab Singh in 1831 A.D. who says, "I should have preferred one of their long matchlocks as a curiosity, but he (Gulab Singh) considered this double barrelled gun a masterpiece of Himalayan skill. You will, however, see some day that it is not a brilliant skill."[61]

Cannons

These were very heavy guns. *Zamzama* or *Top Bhangian* was as big as 84-pounder; details of which are : length-13'.8". calibre-9", thickness of metal breech 6" and muzzle 3.7".[62] Dignified and high sounding names were given to these cannons like *Fateh Jang* (victories in the battle), *Jang-i-Bijli* (thunder of the battle), *Sher Dahan* (roaring of a lion), *Leila and Majnu*, etc. The large cannons bore Persian inscriptions ; giving the name of the founder and the place and the year of the manufacture.

Howitzers

These were heavy guns usually employed in siege. "They had", says F.S Bajwa, "*Kothis* (chambers) at the end of their bores and had greater calibres, greater weights of shot and smaller lengths".[63] The same author gives the following table :

1.	Howitzer—	7 inches	Calibre—	14 inches	length—	42	lbs. wt.
2.	-do-	5.7 ,,	,,	2'-1"	,,	24	,,
3.	-do-	4.3 ,,	,,	3'-9"	,,	9	,,

These varied from 12 pounders to 24 pounders and were mounted on carriages.

Mortars

These were used both as the field-guns and siege-guns. Their calibres were 7 to 8 inches , bores 10 to 12 inches, chambers 5 to 6 inches, thickness of the metal 1 foot to 1 foot 2 inches. These were not made of iron but of gun metal and mounted on carriages. Baden Powell says that "a mortar was the most difficult thing to manage in gunnery, as it was not only most dangerous but most perfectly useless without a proper knowledge of the due strength of the powder and the exact measure of the fuze.[65]

Miscellaneous arms

Apart from these, several other types known to the Mughals were also used by the Sikhs. *Ghabarah* was a mortar for throwing shell, *Gajnal* and *Hathnal* were swivel guns carried on the elephant backs, *Shutarnal* on camel backs, *Aspi* on the horse backs and *Gawai* drawn by the bullocks. *Zamburak* was mounted on a tripod.

Gun powder was used in all types Cartridges and small lead balls were used in the muskets while big balls of zinc, iron, brass, wood or stones were required for cannons. Matches, fuzes and portfires were employed as igniters. All the powder and most of the weapons were manufactured in the state foundries of Lahore, Amritsar, Kotli Loharan, Kashmir and Wazirabad.

References

1. Khushwant Singh, *A History of the Sikhs*, Vol. I (1469-1839) (London, 1963) p. 63. also M.A. Macauliffe, *The Sikh Religion*, Vol. VI (Oxford, 1909), p. 2.
2. These five men were Daya Ram, Dharam Das, Mohkam Chand, Sahib Chand and Himmat Rai.
3. These five emblems begin with the word 'K' *Kesh* (long hair), *Kachha* (underwear), *Kara* (iron bracelet), *Kangha* (comb) and *Kirpan* (sword). The steel bracelet had its practical use in guarding vulnerable portion of the right hand being protected by the shield.

4. Khushwant Singh, *op. cit.*, p. 78.
5. H.R. Gupta, *A History of the Sikhs*, Vol. I *(1739-1768)*, (Simla, 1952), p. 287.
6. Qazi Nur Muhammad, *Jang Namah*, Verses 172-5, (ed. Dr. Ganda Singh, Pub. by Khalsa College); H.R. Gupta, op. cit., pp. 288-9.
7. Abd-ul-Qadir Budaoni's *Muntakhib-ul-Lubab* 1004 H. (Bib. Ind. Calcutta, 1868), Vol. II, pp. 669-70, Khushwant Singh, *op. cit.*
8. N.K. Sinha, *Ranjit Singh*, 34th edition, (Calcutta, 1951), p. 62.
9. F.S. Bajwa, *Military System of the Sikhs* (1799-1849), (Patna, 1964), p. 233 ; and Baron Hugel, *Travels in Kashmir and the Punjab* (London, 1845) p. 350.
10. J.H Archer, *Commentaries on the Punjab Campaign*, 1848-9 (London, 1848), p. 73 ; Vigne, *Travels in Kashmir, Ladakh, Iskardo, etc.*, Vol. I, p. 236 and F.S. Bajwa, *op. cit.*
11. F.S. Bajwa, *op. cit.*
12. Henry Fane, *Five years in India*, (1842), Vol. I, p. 165 and F.S. Jajwa, *op. cit.*
13. Baron Hugel, *op. cit.*, p. 198 and F.S. Bajwa. *op. cit.*, p. 234.
14. Baden Powell, *Handbook of Manufactures and Arts of the Punjab*, Vol. II, Div. III and F.S. Bajwa, *op. cit.*, p. 233.
15. F.S. Bajwa, *op. cit.* p.. 234.

16. H.R. Gupta, *op. cit.*, p. 293.
17. George Forster, *A Journey from Bengal to England*, Vol. I (London, 1798), pp. 332-3 ; W. Franklin, *History of the reign of Shah Alum II*, (Reprint, Allahabad, 1915), p. 76 and H.R. Gupta, *op. cit.*, p. 293.
18. F.S. Bajwa, *op. cit.*, p. 231 and Baden Powell, *op. cit.*, Div. IV.
19. Henry Fane, *op. cit.*, p. 128 ; Baron Hugel, *op. cit.*, pp. 330-1 and F.S. Bajwa, *op. cit.*, p. 232.
20. F.S. Bajwa, *op. cit.*, p. 6.
21. W. Irvine, *The Army of the Indian Moghuls* (New Delhi, 1962), p. 118 and Carraccioli, *Life of Clive*, III, p. 276.
22. George Forster, *op. cit.*, p. 331.
23. W. Franklin, *op. cit.*, p. 74.
24. F.S. Bajwa, *op. cit.*, p. 41 and *Foreign Department Secret and Separate Consultations*, year 1808, 7th Nov. No. 2 (Unpublished : National Archives of India, New Delhi).
25. "Ahmed Shah left his heavy baggage including this master gun in 1761A.D. It was capable of throwing a shot of one maund (82 lbs.) in weight and was looked upon as a marvel. Ahmed Shah's artillery as compared to the Marathas was inferior so he had ordered his representatives in the Punjab to cast guns of a good calibre and send them on to him in the battlefield. Accordingly, two guns of the same size were cast at Lahore in conformity with the instructions of Shah Vali Khan. Their material consisted of a mixture of copper and brass, obtained from a heap of vessels which were collected from Hindu houses. The date of casting (i.e. 1175 A.H. is derived from a Persian line, *"Paikar-i-Azhadaha-i-Atish bar"* upon it. It was taken to Gujranwala in 1765 A.D. by Charat Singh. In 1805 A.D. it was placed in the *Lohgadh* fort, near Amritsar." H.R. Gupta, *op. cit.*, p. 185 footnote.
26. Gyan Singh, *Panth Prakash*, Part III (from Guru Nanak to the Namdharis), (Amritsar, 1830), p. 144.
27. Sohan Lal, *Umdat-ul-Tawarikh*, Vol. II, p. 76 ; Diwan Amar Nath, *Zafar-nama-i-Ranjit Singh*, Ch. VI, and F.S. Bajwa, *op. cit.*, p. 42.
28. Gyan Singh, *op. cit.*, p. 130; Diwan Amar Nath, *op. cit.*, Chapter I and Bajwa, *op. cit*, p. 42.
29. Princep, *The origin of the Sikh Power in the Punjab* (Calcutta 1834), p. 80 and F.S Bajwa, *op. cit.*, p. 53.
30. Sita Ram Kohli, *Army of Ranjit Singh*, Part II and F.S. Bajwa, *op. cit.*
31. Sohan Lal, *Umdat-ul-Tawarikh*, Vol. II (Lahore, 1885), p. 197.
32. Alexander Burnes, *Travels into Bokhara*, Vol. I (London, 1834), p. 59 ; Baren Hugel, *op. cit.*, p. 400.
33. Princep, *op. cit.*, p. 184 ; Bajwa, *op. cit.*, p. 67.
34. A.Burnes, *op. cit.*, p. 165.
35. W.L. Mc Gregor, *History of the Sikhs*, Vol. I (London, 1846), pp. 240-43.

36. William Barr, *Calcutta Review* (1844), Vol. II. p. 173. and Bajwa, *op. cit.*, p. 83.
37. Foreign Department Political Proceedings, 5th Dec., 1836, p. 149 (National Archives of India, unpublished) and Bajwa, *op. cit.*
38. Sir Henry Fane, *op. cit.*, p. 159-160.
39. Sohan Lal, *op. cit.*, Vol. III, p. 558.
40. Baron Hugel, *op. cit.*, p. 327.
41. Sohan Lal, *op. cit.*, pp. 509, 510, 531, 551 and Bajwa, *op. cit.*, p. 88.
42. Lepel Griffin, *Ranjit Singh* (Rulers of India), (First Indian reprint, New Delhi, 1957), p. 142.
43. H.B.O. Pollard, *History of Fire A rms*, p. 6.
44. Baden Powell, *op. cit.*, Div III.
45. H.R. Gupta, *op. cit.*, p. 284 and *Imad-i-Saadat*, p. 71.
46. Victor Jacquemount, *Letters from India* (1829-1832), Tr. with an introduction by Catherine Alison Philips, Vol. II, (London, 1836), p. 34.
47. F.S. Bajwa, *op. cit.*, p. 235 and Baden Powell, *op. cit.*
48. H.B.O. Pollard, *op. cit.*, p. 7 and Bajwa, *op. cit.*
49. Gough and Innes, *The Sikhs and Sikh War*, pp. 67 and 136 and Bajwa, *op. cit.*
50. William Irvine, *op. cit.*, p. 106.
51. F. Steingass, *Persian-English-Dictionary* (1892), p. 362.
52. E. Lake, *Seiges of the Madras Army* (1825), p. 70, note.
53. W. Irvine, *op. cit.*, p. III, and Miskin, *Tahmas Namah* (1196 A.H, fol. 36a).
5 . Baden Powell, *op. cit.*, Div. III.
55. H B.O. Pollard, *op. cit.*, p. 53 and Bajwa, *op. cit.*, p. 236.
56. *Ibid.* p. 114.
57. Foreign Deptt. Pol. Proceedings, 5th Dec. p. 149 and Bajwa, *op. cit.*, p. 236.
58. Foreign Deptt. Proc. *Ibid.* and Bajwa, *op. cit.*, p. 237.
59. W. Irvine, *op. cit.*, p. 112.
60. Baden Powell, *op. cit.*, Div. II, and Bajwa, *op. cit.*, p. 236.
61. Jacquemont, *op. cit.*, p. 34 and Bajwa, p. 237.
62. F.S. Bajwa, *op. cit.*, p. 239.
63. Baden Powell, *op. cit.*, p. 330. and Bajwa, *op. cit.*. p. 239.

For Further Study

1. D.P. Ashta,	*Poetry of the Dasam Granth* (Arun Prakashan, Delhi, 1959).
2. Diwan Ajudhia Prasad,	*Waqai-i-Jang-i- Sikhan* (Pheroshehr and Sobraon, 1846) tr. V.S. Suri.

3. Major, J.H. Archer, *Commentaries on the Punjab Compaign* – 1848–49 (London, 1878).

4. I.B. Banerjee, *Evolution of the Khalsa*, 2 Vols (Calcutta, 1947).

5. S.N. Banerjee, *Ranjit Singh* (Lahore, 1931).

6. Major Evens Bell, *Annexation of the Punjab and Maharaja Duleep Singh* (London, 1882).

7. James, Brown, *History of the Origin and the Progress of the Sikhs* (London, 1788).

8. Capt. A.H., Bingley, *Sikhs* (Govt. Printing Press, Calcutta, 1918).

9. Major James Browne, *History of the origin and Progress of the Sikhs* (London, 1788).

10. Lt. Col. R.G. Burton, *First and Second Sikh Wars* (Govt. Central Branch Simla, 1911).

11. G.C. Chatterjee, *The Punjab-Past and Present* (1939).

12. *Centenary Volumes of Ranjit Singh*, Amritsar, Lahore, Kanpur Publications (1940).

13. Dr. G.S. Chhabra, *Advanced Study in the History of the Punjab*, 2 Vols. (Sharanjit, Ludhiana, 1961).

14. G.L. Chopra and H.L.O. Garrett, *Events at the Court of Ranjit Singh* (1810-17), (tr.) Monograph, 17 (Lahore, 1935).

15. Henry Court, *History of the Sikhs* (Lahore, 1888).

16. H.E. Fane, *Five Years in India*, 2 Vols (London, 1842).

17. J. French, Charts, *Journal of a Tour in upper Hindustan prepared during the years 1838 and 1839* (1854).

18. Ganda Singh, *Banda Singh Bahadur* (Amritsar, 1935) ; *A Short History of the Sikhs* (Orient Longmans. India, 1956); *Punjab in 1839–40* (Sikh History Society, Amritsara, Patiala, 1952) ; and *Private Correspondence relating to the Anglo-Sikh wars* (Sikh History Society, Amritsara-Patiala, 1955).

19. H.L.O. Garrett, *Punjab a hundred years ago*, monograph. 18 (London, 1935).

20. J.H. Gordon, *The Sikhs* (Blackwood, London, 1904).

21. Lepel H. Griffin, *The Rajas of the Punjab* (Lahore, 1870).

22. H.R. Gupta, *Trans-Sutlej Sikhs*, Vol. III Minerva, (Lahore, 1944).

23. J.M. Honigberger, *Thirty five years in the East* (London, 1852).

24. *Indian Historical Quarterly*, Vol. 18, 1942.

25. *J.A.S.B.*, Vol. XVI, Parts I & II (1847).

26. Hansraj Kacker, The Punjab-1729-1849 (Moon Press, Agra 1916).

27. Kartar Singh, *Life of Guru Govind Singh* (Amritsara, 1933).

28. Bhagat Lakshman Singh, *A Short sketch of the life and work of Guru Govind Singh* (Lahore, 1909).

29. Syed Mohammad Latif, *History of the Punjab* (Central Press, Calcutta, 1891).

30. M.A. Maculiffe, *The Sikh Religion*, 6 vols (Oxford, 1909).
31. Malleson, *Decisive Battles of India* (London, 1833).
32. Charles Masson, *A narrative of various Journeys in Baluchistan, Afghanistan and the Punjab*, 3 vols. (London, 1842).
33. W.L. Mc Gregor, *History of the Sikhs*, 2 vols. (J. Maddon, London, 1846).
34. W. Murray, *History of the Punjab*, 2 vols. (William Allen, 1846).
35. L.V. Orlich, *Travels in India including Sind and the Punjab*, 2 vols. tr. H.E. Lloyd (Longmans, London, 1845).
36. W G. Osborne, *Court and Camp of Ranjit Singh* (London, 1840).
37. J.N. Sarkar, *Fall of the Mughal Empire*, 4 vols. (Calcutta, 1949-50).
38 Sohan Lal Suri, *Umdat-ul-Tawarikh*, 5 vols, tr. V.S. Suri (S. Chand and Co. Delhi, 1961).
39. G.B. Scott, *Religion and Short History of the Sikhs* (London, 1930).
40. N.K. Sinha, *Rise of the Sikh Power* (Calcutta, 1946).
41. Teja Singh & Ganda Singh, *Short History of the Sikhs* (India, 1950).
42. Sita Ram Kohli, *Catalogue of Khalsa Darbar Records*, 2 Vols. (Lahore. 1919).
43. Thornburn, *The Panjab in Peace and War* (London, 1904).
44. T.H. Thornton,, *History of the Punjab*, 2 Vols. (London, 1946).

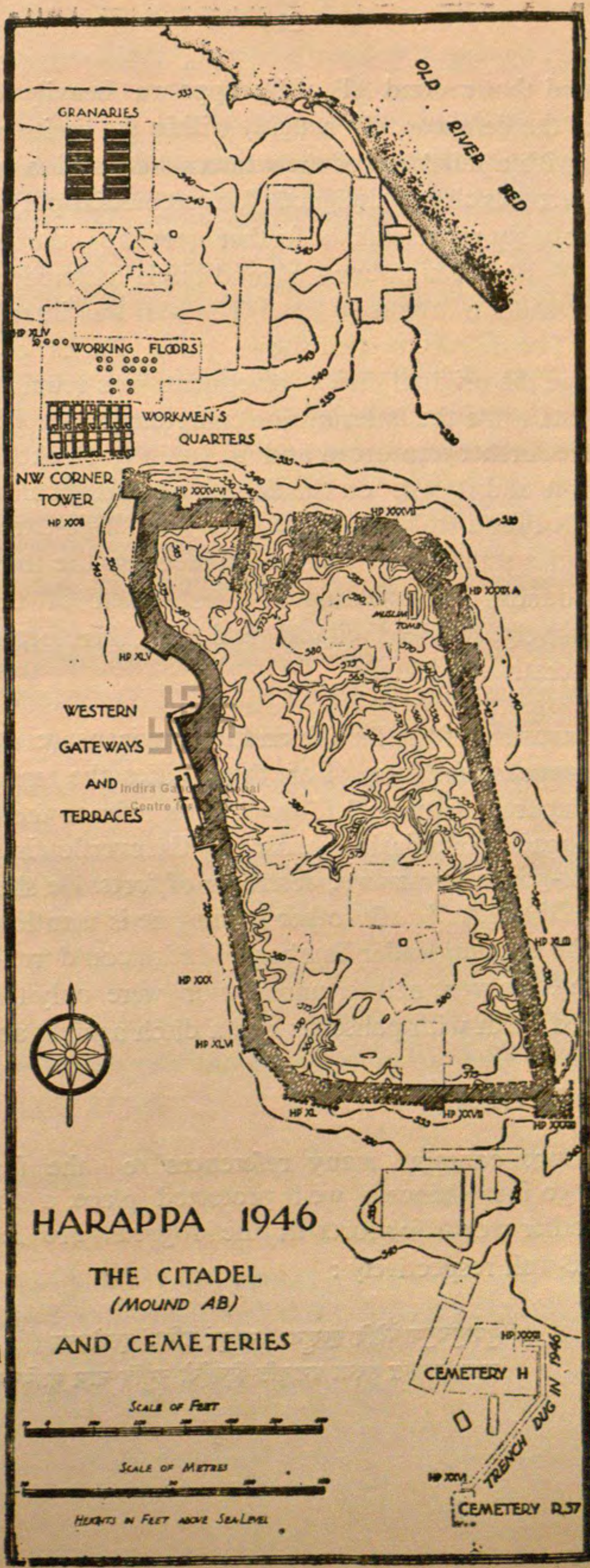
ANTIQUITY OF FORTIFICATION IN INDIA

"Forts in India have a hoary past," B.C. Dutt in his book, *"Town Planning in Ancient India"* has rightly remarked that, "These fortifications in the form of rampart and ambient trenches almost constituted an integral part of oriental as well as occidental town planning. So much so we scarcely come across a description of any town which is silent about them."[1] The passage in *Markandeya Purana* as translated by Pargitar runs thus : Living on the mountains and by the seaside they (men at the beginning of the Creation) lived wholly without habitation. Hard realities of struggle and strife dawned on men. In noble 'Nature' they found some relative unkind forces of heat and cold. The mystery that the lamp of life needed regular fuel made them up and doing. Then for the sake of combination and resistance they made towns at first and they resorted to fortress in inaccessible deserts and wastes, in mountains and caves ; also they industrially constructed with their own fingers an artificial fort on trees, mountains and in water.[2]

The simplest type of man-made fortification seems to have been the thorn hedge. This was supplemented by the earthen bunds. They were, later, strengthened by a palisade of tree trunks. A development over this was masonary walls. Two walls hollow between them were built, the hollow space was subsequently filled up with earth. The face of the outer wall was raised by a few feet and crenellated to give protection against arrows and other projectiles. Later on towers at intervals were built into the wall.

Forts of the Indus Period (2500 B.C.--1500 B.C.)

Prior to the excavation of 1946 A.D. it was a common belief that Harappa and other similar towns were unwalled. Sir Mortimer Wheeler through excavations has disproved this ; in Harappa we find definite traces of citadel with imposing defences.[3] Cunningham has also vaguely referred to the 'remains of the walled towns of Harappa.'[4] Similarly, the reference of Masson who stayed in a brick castle pertains to a Mughal fort (now a police station) situated at the place. Burns had no doubt anticipated the existence of a citadel but could not substantiate it.[6] It was Sir John Marshall who fore-suggested 'town walls' and Mackay did find some traces of it at Mohen-jo-daro.[7]



(after Wheeler)
Courtesy : Archaeological Survey of India.

Wheeler found that mound AB of Harappa was heavily fortified and describes thus : "The plan of the defences falls roughly within the limits of a parallelogram, 400 yards by 200 yards with a 'bite' out of the western side, and a western gate-system of complex plan, with terraces clearly designed for ceremonial purposes. A re-entrant on the northern side probably represents a further (perhaps the main) entrance."[8] The wall was built on a 10- 20 feet high bund of mud brick, battered both from inside and outside, with a basal width of about 40 feet. The wall was interlaced with rectangular towers at intervals. The defence system shows three phases of construction. After a long period of damage the original brick revetment was rebuilt and broadened. The work was of brick-bats while the latter of fine complete bricks. Finally the reconstructed fortifications were further reinforced and a gateway blocked which shows that the city was on the decline and it was on the debris of this fortification that an intrusive culture flourished. It shows that Harappa and Mohen-jo-daro, a little larger than Harappa, were the cities standing in isolated grandeur on the Indus plain. The rest are relatively small mounds, representing villages. Each of these royal capitals was dominated by a massively fortified citadel and must therefore have been subjected to autocratic or bureaucratic citadel rule.

The Aryan invasion of the Punjab and its environs (c. 1500 B. C.) was an onslaught upon these walled cities here. For these cities the terms used in the *Rigveda* is *Pur* meaning a rampart. Autumnal (*Saradi*) forts refer to the forts "occupied against Aryan attacks or against inundations caused by the overflowing rivers in that season."[9] Indra, the Aryan war-god is *Purandara*, destroyer of forts. He shattered 'ninety forts' for his Aryan protege Divodasa.[10] In other hymns, he is mentioned to have destroyed hundred castles of the original leader Sambara.[11] Indra could 'rend forts as age consumes a garment "[12] These forts were neither unreal nor were only the places of refuge with ramparts of hardened earth with palisades and a ditch against attack.

Fortification in the Vedic Age

Vedic literature contains many references to the forts. *Durga* in Sanskrit means "difficult to go into" hence a well protected place, a fortified area or a fort.[15] Apart from *Durga* other words for forts in the *Rigveda* are *Pur* and *Dehi* meaning rampart and defence-wall respectively :

युधायुधपुम घेदेषि घृव्णुया पुरा पुरं समिदं हस्योजसा ।
नम्या यादेन्द्र सख्या परावति निबर्हयो नमुचिं नाम मायिनम ।।[16]

(*Rigveda*, I. 53.7)

The forts made of stone and iron were also known to the *Rigvedic* people e g. :

अच्छिद्रा सूनो सहसो नो अद्य स्तोतृभ्यो मित्रमहः शर्म यच्छ ।
अग्ने गृणन्तमहंस उरुष्योर्जों नपात् पूर्भिरायसीभिः ॥ [17]

The reference to iron forts appears to have been used in the metaphorical sense. It refers to the forts stronger in nature and not the one really made of iron. At one place, *Rigveda* refers to 'hundred walls' made of stone (and not 'hundred cities' as translated by Bhattacharya) which shows that walls, at least, of the fortifications were of harder material than mere bamboos or planks :

शतभुजि मिस्तम भिहुतेरघाट पूर्भी रक्षता मरुतो यमावत ।
जन यमुग्रास्तवसो विरप्शिनः पाथना शंसात तनतस्य पुष्टिसु ॥[18]

In some cases epithets like *Dradha* (*Rigveda*, V. 19.2) and *Drmihta* may refer to the forts, the existence of which may also be inferred from expressions such as *Durgani* and *Krtimas* (artificial barriers). Cities with hundred enclosures or fortifications (*Shatbhuji*) referred to above (*Rigveda* I. 66.8) has led Muir to believe that "this no doubt suggests the idea of forts consisting apparently of a series of concentric walls, as actually existing in the country at that time."[19]

According to Macdonell the *Puras* were fortified enclosures erected at the time of some danger, without any house in them.[20] But several hymns (*Rigveda*, I. 24. 189 ; VI.27 ; IX. 107. 10) may be taken to refer to the existence of private citizens in a *Pur* (city).[21]

The strong cities or forts described in the *Rigveda* refer to those of *Asuras* only. It is, therefore, probable that the *Asuras* of India were more advanced in fort architecture than the Vedic Aryans.

Forts in Later Vedic times

Several references can be culled from *Brahmana* and *Sutra* literature in which are discussed the various methods of examining the proper site of a building and the allocation of lands according to the colour and taste, etc. The auspicious moments for erecting a fort, worship of various gods at the time of fort construction, etc., are the main subjects relating to *Vastuvidya* in the *Grhya Sutras*.[22]

The *Yajurveda Samhita* frequently refers *Mahapura* which means 'a great fortress' :

तेषामसुराणां तिस्रः पुर आसन्नयस्मय्यवमाऽथ रजताऽथ
हरिणी ता देवा जेतुं नाशक्नुवन ता उप सदैवाजिगीषन
तस्मादाहुर्यंश्चवं वेद यश्च नोपसदा वै महापुरं
जयन्तीति त इषुँ समस्कुर्वताग्निमीकं सोमं
शल्यं विष्णुं तेजनं तेडब्रुवन क इमामसिष्यतीति [23]

In the *Atharvaveda* the word *Vapra* occurs many times which means rampart.[24] It points out to a fort of 'Kine' (*Gomati*) and explains that this kind of fort was utilised to protect the cattle However, these were temporary forts as compared to those of medieval ones. Evidently these were merely the places of refuge against an onslaught and ramparts of hardened earth with palisades and ditches. Pizchel and Glender are of the opinion that the Vedic Indian towns had wooden walls and ditches like the later Indian towns of Pataliputra known to Megasthnese and Pali text books.[25]

The *Brahmanas* and the *Upanishadas* also refer to the words *Pura* and *Mahapura* to mean the forts. *Puranas* also mention forts. In *Devi Purana* we find, "the construction of the brick-built walls is indispensible in the artificial forts."[26] In addition to parapets and towers with movable ladders, we find references in these *Purans* to weapons like *Sataghnis* (hundred killers) and *Nalikastras* (barrelled missiles).[27] In the second *Anushangapada* of the part I of the *Brahmanda-Purana* the different type of forts have been described :

खेटानामम् च पुराणामं च ग्रामाणां चैव सर्वशः ।
त्रिविधानां च दुर्गाणां पर्वतोदकधन्वि नाम ।। [28]

Forts in the Epic Period

In the *Ramayana* we get an elaborate description of the fortified cities. Forts, here, are divided into four classes such as the river forts (*Nadya*), the hill fort (*Parvatiya*), the forest fort (*Vana*) and the artificial fort (*Krtrima*).

Forts were protected by strong walls and ramparts and ditches were dug around to afford additional protection. Four elaborate gateways (*Gopuram)* were erected for entrance into the city and each was approached by crossing a bridge erected over a ditch supported by many pillars and platforms. The entrance was protected by strong doors and bolts. Watch-towers (*Attalaka*) from which the movements of the enemies outside the city walls could be observed, were also erected. These features are noticeable in Ayodhya, Sugriva's capital in *Kishkindha* and of Ravana in Lanka. Lanka was protected by many such forts :

लंकापुरी निर्लम्ब देव-दुर्ग-भयावहा । नादेयंम् पार्वतम्
वनयम कृत्रिमय च चर्तु-विर्वम ।। शैंलाग्रे रचितदुर्गं
सा पुर देव पुरोपम । [30]

Thus we see that the *Ramayana* presents a picture of highly developed fort-architecture. While the many storeyed buildings and fortifications prove the constructive genius of the people, the decorated windows and the *Toranas* testify of their artistic sense.

In the *Mahabharata* it is clearly stated that the cities should be established, supported and protected by one of the six forts. The classification of forts into six varieties in the *Mahabharata* is similar to those enjoined in the *Vastu Shastras* i.e. *Dhanva Durga* (desert fort), *Mahi Durga* (earth fort), *Giri Durga* (hill fort), *Manushya Durga* (human fort), *Mrd Durga* (artificial fort) and *Van Durga* (forest fort) :

धन्वदुर्गं महीदुर्गं गिरिदुर्गं तथैव च ।
मनुष्य दुर्गमब्दुर्गं वनदुर्गं च तानि षट ।। [31]

The classification differs in some respects from other later treatises. In the *Mahabharata* the water fort (*Udaka Durga*) is not mentioned. In many respects the classification is similar to those found in the *Manu Samhita* and the *Puranas*.

The *Shanti Parva* of the *Mahabharata* contains several chapters dealing with the fortification of the cities at the time of danger. In this an interesting episode is recorded that when Yudhisthira, the eldest of the Pandava brothers, enquired about the kind of cities in which the king should dwell, Bhisma replied in detail about the defence of the citadel. Bhisma said, "Keeping his eyes on the six different kinds of citadels, the king should build his cities containing every kind of affluence and every other article of use in abundance. Those six varieties are water citadels, earth citadels, hill citadels, mud citadels, human citadels and forest citadels. (Water citadels are those that are surrounded on all sides by a river or rivers or the sea. Earth citadels are those that are built on plains fortified with high walls and encircled with trenches all around. Human citadels are unfortified cities properly protected by guards and a loyal population). The citadel should contain an abundant stock of rice and weapons, should be protected with impenetrable walls and a trench, should be teemed with elephants and steeds and cows, should be inhabited by men versed in mechanical arts and provisions of every kind should be well stored" :

यत्पुरं दुर्गसंपन्नं धान्यायुध समन्वितम् ।
हढ़प्राकारपरिखं हस्त्यश्वरथसंकुलम् ॥ [32]

Bhisma further said, 'The king should increase his store of fuel, iron, chaff, charcoal, timber, horns, bones, bamboo, marrow, oils, and ghee, fat, honey, medicines, flax, resinous exhudation, shafts, leather, catguts (for bow strings), canes and cards made of *Munja* grass."[33]

In the *Adiparva* of the *Mahabharata* the origin of the fortified Delhi (the then Indraprastha) has been beautifully illustrated. The description also contains the precautions taken at that time for the defence of the capital. It runs thus : "The Pandavas agreeing to the suggestion of Dhritrashtra set out from Hastinapura and reached to Khandavprastha which was an unreclaimed desert. The Pandavas, with Krishna at their head, selected a beautiful place and made it a second heaven. They selected an auspicious region, performed certain propitiatory ceremonies and measured out a piece of land for their city. Then surrounded it by the trench, wide as sea and walls reaching high upto heavens and white as the fleecy clouds or the rays of the moon. It was protected with gateways looking like the clouds and high as the *Mandara* mountain. There were walls furnished with darts and other missiles. The turret along the walls were filled with armed men; and the walls were lined with numerous warriors along their whole length. There were thousands of sharp hooks and *Sataghnis* (machines slaying a century of warriors) and numerous other machines on the battlements. Decked with innumerable mansions, the city became like unto Amaravati and came to be called Indraprastha."[34]

The description of the forts given in the *Mahabharata* enables us to form a clear idea of the defensive structure of a fort. A fort was usually surrounded on all sides by ditches or *Parikha*. These ditches of a city have been compared in point of their width to an ocean. The ditches of Ravana's fort were unfathomable.[35] Ditches were further made inaccessible by being filled with dangerous acquatic animals. Water was made to flow from rivers into these ditches by means of hidden gates (*Sankata Durga*).[36] The *Prakaras* resembled masses of white clouds or were radiant like the moon.[37] Some are called *Ratna Prakaras*, i e. set with jewels. These walls must have been very high. The adjective 'white' is given to some of them and this clearly shows that they were coated with white plaster. Watch towers stood over the walls and they were of various forms—the *Atta*, *Attalaka*, *Pragandi* and the like. Other structures which were set up on the walls where soldiers lay hidden and whence they threw arms were called *Akasajanani*, *Huda* and *Gulma*. Walls had towers called *Giris*.[38]

Panini refers to ramparts (*Prakara*), moat (*Parikha*), towers (*Sandhayah*) and gates (*Dvara*) as important parts of a city which served as main defence. Several such forts have also been mentioned in the *Manu Smriti* :

घनु-दुर्ग महीदुर्गं अबदुर्गम वार्क्षं एव वा ।
नृ दुर्गं गिरिदुर्गम वा समाश्रृत्य वसेत पुरम ।। [39]

Forts in the Jatakas

Interestingly, the *Jatakas* (stories of the Buddha's former births datable not later than 3rd-2nd century B.C.) contain many references to forts and fortification. The *Ekpananna Jataka* (No. 149) describes Vaisali, which in those days enjoyed considerable prosperity. A triple wall encompassed the city, each wall a league distant from the next, and there were three gates with watch towers.[40] The commentary on the *Udai Jataka* (No. 458) presents three kinds of moats viz., *Udaka*, *Kaddana* and *Sukha*—a water moat, a mud moat and a dry moat respectively. In one of such fortified palaces *Sakha* (Bodhisattva) appeared before the king's daughter Udayabhudda in her sleeping chamber. The princess was sitting quiet and alone, in a magnificent chamber upon the five terraces of her seven storeyed mansion, fully guarded. He prayed to let him spend that night with her. To this the princess answered :

> "To this battlemented city, dug with moats, approach is hard
> While its trenches and its towers hand and sword unite to guard." [41]

Chullakalinga Jataka (No. 301) mentions that Assaka was the king of Potali and Kalinga was the ruler of Kalinga. King Kalinga challenged everyone to war but the kings of various cities, from wherever they came, were frightened to enter the city, and hence sent their presents. They were so much afraid that they had their quarters outside the city walls.[42] The *Mahajanaka Jataka* (No. 539) highly speaks of the glory of Mithila. But the prince's mind was intently turned towards giving up the kingdom. He decided to leave Mithila, adorned and decked, to go to Himalayas. He, thus, narrates the glory of Mithila :

> "With walls and gates and battlements,—traversed by streets on every side
> With horses, cows, and chariots thronged with tanks and gardens beautified."[43]

In the *Maha-ummagga Jataka* (No. 546) also reference to fortification and city walls is made. Here we read, "He caused a great rampart to be built for the city. Along the rampart were watch-towers at the gates and between the watch-towers he dug three moats—a water moat, a mud moat and a dry moat............This was done as a defence against future dangers.[44]

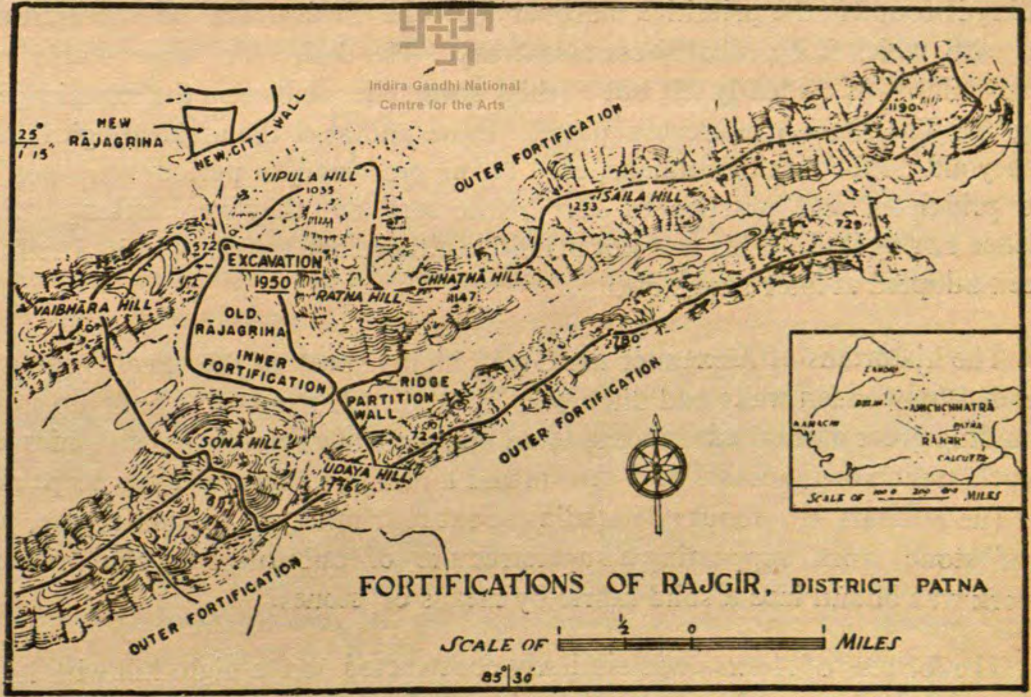
Thus the cities of the *Jataka* period were all fortified with walls and ramparts, watch-towers and massive gates. The *Tandulandi Jataka* informs us that the walls of Benaras were twelve leagues round by themselves. The description of an *Ummaga* or an underground tunnel (No. 546) which a certain person named Mahosadha had constructed, in order to elude the pursuit of his enemies, is an instance which shows that underground structures were also not unknown in those days.[45] The *Attalaka* (towers with quarters for watchmen), *Prakaras* (ramparts), *Parikha* (ditches) and *Ottahaka* (simple towers) were essential features of the big cities (Nos. 534 & 458).[47] The many storeyed dwellings, the underground chambers and the stone roofs referred to in the Pali canons also coroborate the accounts of the *Jatakas*, mentioned above, and prove beyond doubt the developed engineering skill of the Indians.

Pre-Mauryan Forts

Cities largely of wooden construction had begun to appear in the various parts of the country and according to Dhammapala, the great Buddhist commentator, they were planned by an architect of the name of Maha Govinda who is stated to have been responsible for the layout of several of the capitals of northern India in the fifth century B.C. This is the first mention of an architect in the annals of the country. On principle these cities were rectangular in plain and divided into quarters by the main thoroughfares intersecting at right angles, each leading to a city gate. One of these quarters contained the citadel and royal apartments while the rest were for the residences of the upper classes, middle classes and traders, etc. Of the quarters reserved for the citadel and palace a fairly detailed account has been handed down and the general arrangements of these citadels and royal residences have so much in common with the later medieval palaces of India that it seems evident the latter were a continuation of our ancient convention.[47]

In spite, however, of the evidence of the literary records which indicates that much of the building construction at the early date was of a temporary nature, the one example that has survived proves that some efforts were already being made to produce stone masonary of a durable character.[48] The beginnings are seen in the city walls of Rajgriha, the ancient capital of Magadha, now a vast area of ruins in the Patna district of Bihar. The layout of the city of Rajgriha indicates fairly advanced state of town planning. Rajgriha was also known as *Girivraja* which was the capital of Bimbasara

(c. 603-515 B.C.). The *Mahabharata* refers to *Girivraja* as the capital of the much earlier king, Jarasandha of Magadha and describes it as being protected by five hills which can be identified—the hills called 'Vaibhara,' 'Varaha,' 'Vrishabha', 'Rishigiri', and 'Chaityaka'. Later Bimbasara changed the name to Rajagriha which was also known as Bimbasarapuri. The gates of the city were closed in the evening to all including the king.[49] The city was surrounded by an immensely strong, 10 feet high and 16 feet thick, boundary wall of uneven and undressed blocks of stone, each block about four feet long carefully fitted and bonded together. The core between was composed of smaller blocks less carefully prepared with fragments of stone packed within the interstices. No mortar appears to have been used. This type of masonary seems to have been carried upto a height of about twelve feet. This wall connected the crest of all the five adjoining hills encircling the valley, for a length of about 30 miles. Above the wall (rampart) was raised super-structure of small stones or bricks and in places, of both wood and stone combined. Solid rectangular bastions of the same materials about



FORTIFICATIONS OF RAJGIR, DISTRICT PATNA

(after A. Ghosh)

Courtesy : Archaeological Survey of India, New Delhi

50′ x 40′ strengthened the wall at intervals. Stairs and ramps were constructed in the thickness of the wall, in its inner face, to give access to the top which accommodated soldiers for defensive purposes. As mentioned in the Pali works, Rajgriha was said to have possessed 34 large and 64 small gates. Of them only one gate of the outer fortification was visible. The inner city fort-wall with its pentagonal plan was not furnished with any ditch. The main gate had heavy doors of stone slabs which were further joined together by strong iron clamps both horizontally and vertically. The ruins of some of these watch-towers and gates are still visible. One such watch tower is called *Jarasandha-ki-Baithak* which is composed of huge undressed stones piled one upon the other and is about 50 feet square and 28 feet high.[50] Foreign merchants and outsiders had to deposit their arms with the officer-in-charge at the main gate. From the 'crests' of towers *Dauvaricks* sounded trumpets to announce *Praharas* (time) at regular intervals.

The remarks of Percy Brown about this wall do not lead us to logical conclusions. He says, "It is noteworthy that the same system (as adopted in this wall) of walling is found in the primitive masonary of the Pelasgicum of the Acropolis at Athens with which it is probably contemporary. The desire for some stable method of construction was evidently felt but at this stage the skill and the experience were lacking".[51] The literary references quoted above and also the archaeological remains prove beyond doubt that the Indians, even in the pre-Mauryan period, were well versed in the principles and practice of fort-architecture and they were lacking neither in experience nor in skill. This was not primitive either but a style within itself which has been adopted at later stages also.

The historians of Alexander the Great, highly speak of the great Indian cities surrounded by wooden walls and ditches in 326 B.C. *Massaga* was built up as a fort commanding great natural advantages, as an eminence inaccessible on all sides against steep rock, trecherous morass, deep stream and a rampart guarded by a deep moat to boot. The rampart was about "35 stadia (about four miles) in circumference, with a basis of stone work supporting a superstructure of unburnt, sun-dried bricks. The brickwork was bound into a solid fabric by means of stones."[52]

The fortress of *Aornos* was similarly constructed on a high hill with its water supply arranged by tapping a local spring and food grown with the labour of a thousand men in an adjoining field to render the fort self-sufficient against a siege.

It is stated that these forts were possessed of battlements which were so strong that Alexander had to bring up military engines to batter down the walls.[53] The *Kathians* had a strongly fortified city called *Sangala* with its walls made of brick.[54] The *Malloi* had also many walled cities with citadels of commanding heights and difficult to access. Alexander had to apply scaling ladders on all its sides to undermine its walls. The walls had towers at intervals. In scaling the walls, Alexander was assailed from everyside from the adjacent towers.[55]

Mauryan Forts

A strong firm government administered over a large territory usually implies an advance in human endeavour, and with the rise of the Mauryan dynasty towards the end of the third century B.C., which established for the first time a single paramount power in northern India, marked cultural progress was made. Among other achievements the art of fort building, stimulated by the royal patronage, took a notable step forward. Megasthnes's account of the Mauryan capital of Pataliputra, is an illustrative example. The Greek ambassador who resided at the court of emperor Chandragupta in about 300 B.C., presents us with a striking picture of the great Indian ruler's stronghold. He informs us that the city stretched in the inhabited quarters to an extreme length on each side of 80 stadia (nearly 9¼ miles) and that a ditch encompassed it all round, 600 feet in breadth and 30 cubit in depth, that the wall was covered with 570 towers and four and sixty gates.[56] It ranged along the banks of the Ganges like an immense castellated breakwater surrounded by a stupendous timber palisade, with loopholes for archers and protected externally by a wide and deep moat. Within the wall was the royal palace-fort, evidently a much more spacious and elaborate edifice than that erected by any previous ruler in the country.

Of the fortifications surrounding the great capital of Mauryan empire nothing has survived except fragments of the wooden ramparts unearthed at Bulandi Bagh, near Patna, the beams of which by their size prove that the Greek envoy's account of its dimension was by no means exaggerated The spade of the archaeologist has disclosed the prevalence of ditches and senile wooden palisades at Pataliputra. The town was enriched by rivers—the Ganges in the north the Poonpoon in the east, the Sone in the south and west. Thus with this natural fortification, the city had the second line of defence of the mud ramparts. About one mile interior to these ramparts was another line of defence which consisted of ditches. After the ditches stood the wooden palisade, vestiges of which were exposed by Spooner in his excavations[57] An idea can be gained from the foundations which consisted of timber laid in parallel lines like railway sleepers each 12 or 13 feet long, corresponding to the thickness of the stockade.

The *Arthasastra* of Kautilya affords an interesting and valuable study of fort-architecture. The great diplomat and writer impresses the importance of defensive fortifications against the enemy. According to him, forts were of various types and designs. The forts constructed on grounds naturally best fitted for the purpose were called *Durga.* The waterforts *(Audaka)* were generally constructed on plains surrounded by low ground or on islands in the midst of the rivers. Mountainous fortification (*Parvata*) was on rocky tracts or caves converted into the forts (Pl. LV). Forts in deserts and wild tracts devoid of water and overgrown with thickets growing in barren soil were termed as *Dhanvana* while those in the forest as *Vandurga* :

> "अन्तद्वीपं स्थलं वा निम्नावरुद्धमौदकं, प्रास्तरं गुहां
> वा पार्वतं निरुदकस्तम्बमिरिण धान्वनं
> खंजनोदकं स्तम्भगहनं वा वन दुर्गम"[58]

The classification is same as described earlier. The mountain-forts were best suited to defend populous centres while desert and forest fortifications served the purpose of habitations in wilderness.[59]

The place itself was designed as a fort (Pl. LV). It was either in the centre of the kingdom or in a locality naturally well protected, such as at the confluence of rivers. The palace-forts were circular, rectangular or square in form but in each case was surrounded with an artificial canal and connected with both water and land paths. Round this fort three ditches, each at a distance of six feet, 144, and 72 and 60 feet in width were dug. The depth was also generally 36, 18 and 15 feet respectively. The bottom was square in shape. The sides of the ditches were of stones or bricks. The ditches were filled with perennial flowing water and they contained crocodiles and lotus plants.[60]

At a distance of 24 feet from the innermost ditch, a rampart was erected. It was 36 feet high and 72 feet broad, square at the bottom, oval at the centre and planted with thorny and poisonous plants on the top :

> चतुर्दण्डावकृष्ट परिखायाः षडदन्डोच्छ्रितमवरुद्धं
> तद्विगुणविष्कम्भं खाताद्वप्रं कारयेत् ऊर्ध्वचयं
> मंचपृष्ठ कुम्भकुक्षिकं वा हस्तिभिर्गोभिश्च क्षुण्णं
> कन्टकिगुल्मविषवल्लीप्रतानवन्तम् । पांसुशेषेण वास्तुच्छिद्रं
> वा पूरयेत"[62]

Above the ramparts were many parapets each about 20 feet apart.

Towers, square throughout and with movable ladder equal to its height were constructed. Each tower was at a minimum distance of 180 feet and in between two such towers was a broad street and a double storeyed building. Between the tower and the broad street was constructed *Rudrakosha* affording seats for these archers. The roads leading to parapets were not less than six feet in width. In an unassailable part of the rampart was made a passage for flight and a door for exit. Outside the rampart the passage for movements was covered with pits, sands, water-pools, palm-leaf, etc. The entrance gate to the fort was 6 to 8 feet wide.

The pillars were divided like this : one fourth of the total length for the capital, 6 parts height and 12 parts underground. On the ground floor were formed a hall, a well, a boundary house, while on the top floor, a staircase circumbulating from left to right, on the right a secret staircase hidden in the wall, a projecting balcony for archers.[63]

Kautilya has recommended that in the centre of the parapet should be constructed a deep lotus pool, a rectangular building of four compartments, one within the other and *Kulya* (canals) to hold weapons. There used to be several buildings inside the fort. The ideal fort was having 12 gates and one secret passage connected with both water and land ways :

त्रयः प्राचीना राजमार्गास्त्रय उदीचीना इति वास्तुविभागः ।
स द्वादशद्वारो युक्तोदकभूमिच्छन्नपथः ॥[64]

Chariot-roads, royal-roads and roads leading to the town were made. The roads for elephants were 16 feet wide while for chariots, cattle and men 7½, 6 and 3 feet respectively. In the midst was constructed the king's palace which occupied a ninth part of the whole site inside the fort.[65] On the north to the palace were the houses for priest, teachers and ministers. The royal kitchen, elephant stable and storehouse were on the south while merchants and soldiers lived on the east. There was ample provision for water-reservoir, hospital, music, treasury, burial grounds, pastures, etc. Oils, ghees, eatables, raw material and other things of daily use were stored in such quantities as could be enjoyed for years. Of these collections the old things were replaced by new ones when received.[66]

Elephants, cavalry, chariots and infantry, each officered with many chiefs and subordinates, were present.

हस्त्यश्वरथपादातमनेकमुख्यमवस्थापयेत् [67]

The boundary guards were the persons of high character. The forts were frequently repaired. Such persons were never admitted in the fort who were dangerous for the well-being of the country :

न च वाहिरिकान्कुर्यात्पुरराष्ट्रोपघातकान् ।
क्षिपेज्जनपदस्यान्ते सर्वान्वादापयेत्करान् ।।[68]

Post-Mauryan

The accounts of Megasthenes and Kautilya about the forts of this time are amplified by materials derived from another source namely the pictures of various historic towns carved in bas-reliefs on the Buddhist monuments, which, although of later date, are no doubt substantially representative of the fort-art of this period. On the Sanchi gateways, as backgrounds to battles and processions, there may be seen portions of such famous cities as Kapilvastu (the place of Buddha's birth), Kusinagara (under the walls of which was waged the War of Relics), Urvila (the scene of the Serpent Miracle) and Rajagriha (the old Magadhan capital). All these towns appear to be of an established type, strongly fortified and surrounded by high walls having battlements with the merlons corbel stepped after the manners of those in the Assyrian bas-relief. Specially noticable are the city gates of Kusinagara carved on the south *Torana* at Sanchi being so carefully delineated and in such detail that it is possible to reproduce it in perspective, together with its surroundings.[69]

In the excavations of Ahichchhatra (near the village of Rampur in Bareilly district, Uttar Pradesh), were found the ruins of the ancient fortress extending several miles in circumference with about three dozen or so bastions. The towers were generally 28 to 30 feet in height, the highest in the southernmost side being 47 feet. (This fort was later on restored by the Muhammadan kings). Of the still earlier periods were traced the burnt bricks in the succeeding levels and in the period II of the fortress of the first century B.C., a defensive brick wall fortifying the city was found over two earlier earthen ramparts.[70]

Eran—Ancient *Airakina*, mentioned in the Stone inscription of Samudragupta, a village on the left bank of Bina, in the Kurai sub-division of the Sagar district, Madhya Pradesh, was another fortified town. Roughly towards the end of the prehistoric period the settlement was enclosed by a wide mud rampart and a moat outside it except on the river side which afforded natural protection to the city.[71]

The spade of the archaeologist has unearthed the ruins of the city which lies at Kosam, a village 28 miles south-west of Allahabad. A rectangular massive fortification wall enclosing a large part of the area begun by about the 9th century B.C. with repairs and additions made in the succeeding stages. Originally the defences were of mud rampart-wall with a burnt brick revetment on the exterior laid in a batter. A subsequent rampart was laid in the second period. Guard rooms, bastions and a stone paved corbelled drain were added. There were further extensions of the rampart in the third stage. Evidences of human sacrifice were also noticed outside the fortifications. The defences showing additions and alterations in the fourth and fifth stages were also found. Thereafter the fort fell into disuse in the last phase with the destruction of the town by the Huna chief, Toramana, whose seal was found here.[72]

The defences of the ancient city of Vaisali in Bihar, were of three periods—the original rampart built with burnt bricks in the Sunga period, heightened with earth in the time of the Kushanas with a moat encircling it and finally in the Gupta period brick was used again with structural additions.[73]

A massive rampart with a moat has been discovered at Ujjain. It dates back to c. 750 B.C. The rampart enclosed an area of 1¾ miles with a width of about 200 feet and the maximum height 42 feet. Several openings in the area occupied by the rampart suggested gateways. A thick wall with a gentle slope on the inner side and less pronounced on the exterior was set up by the dumping of dug up yellow and black clays. The moat apparently connected with the Sipra river runs along the southern and eastern sides, being surrounded on the north and the west by the river itself. Filled with greenish water borne silt, the moat was 80 feet wide and 22 feet deep in its effective use. Evidences of repairs in the rampart were also noticed.[74]

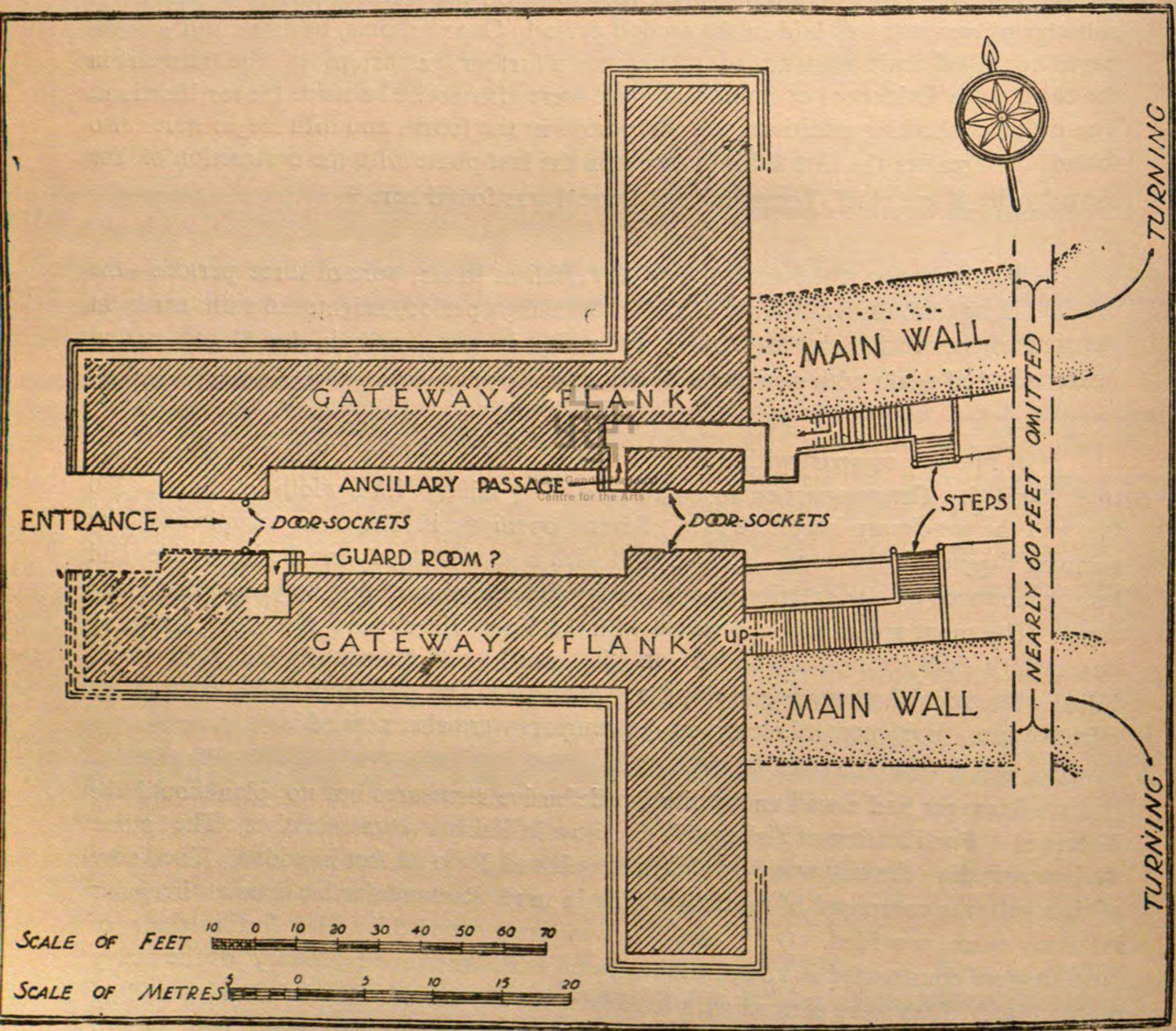
Besnagar had a wall and a ditch as defensive structures but no plan could be discerned. Fortification at Sirkap (Taxila, now in Pakistan) was massive. The stone wall surrounding the city was 3½ miles in length and 15 to 21 feet in width. The core of this wall was composed of random rubble in mud. Rectangular bastions at irregular intervals were provided. Only one gateway was exposed.[75] The fortifications of Sirsukh were constructed in rough rubble, faced with limestone masonary of the heavy diaper type. They were pierced with loopholes for the use of the defenders standing on the ground floor. The bastions were semi-circular on plan instead of rectangular.

SISUPALGARH 1948

(ORISSA)

Western Gateway No. 1

Site SP IV



Courtesy : Archaeological Survey of India, New Delhi.

Excavations at Sisupalgarh in Orissa state, brought to light defences ascribable to the beginning of the 2nd century B.C. with three successive building-phases. In the first phase defences comprised of a massive clay rampart 25 feet high and 100′ wide at the base. It was a made up earthen bund with sticky clay. On the top of the rampart occurred a series of circular holes, each one foot deep and arranged at regular intervals of 1 foot 10 inches These cavities were filled with laterite gravel and packed with clay.[76] During the second phase a layer of laterite of 4′ to 6′ in thickness was added to the top of the clay rampart. In the third phase two brick built walls, 25′ apart, were built over the top of the laterite gravel and the space in between them was filled up with mud and earth. A ramp 3 to 4 feet in thickness could be perceived towards the interior of the fort and outside the wall. The fourth phase does not seem to have followed third phase immediately. The fort had eight large gates, two on each side.[77]

Recent excavations at Nagarjunkonda in the Andhra Pradesh exposed to view the vestiges of the city Vijaypuri, the glorious capital of Ikshavakus in the 3rd century A.D.[78] Pertaining to it was exposed a fortification wall enclosing a trapezoidal area of 3000 × 2000 feet. On the west there was River Krishna while on the south the Peddakundelugutta hill. Distinctly, two building-phases could be seen in the fortification. The early phase represented a rampart of mud with a basal width of 80′ resting on the natural soil. At another place, beneath this rampart could be seen a flooring and a few hearths. The second phase represented a burnt brick wall of 9′ to 14′ thickness over the rampart. Save the portion overlying the Peddakundalugutta hill, the fortification wall was surrounded by a ditch, 12′ in depth and varying of width from 74′ to 132′. The fortification had two main gateways on the east and the west and a postern gateway on the north. Perhaps this postern gateway served as an emergency exit. These are not uncommon. The defence wall at Sisupalgarh had one such postern gateway.

During the excavations at Balirajgarh in district Darbhanga new light has been thrown on the structural details of the fortifications.[79] The defence-wall consisted of a mud brick core with brick encasement, the outer one being four times the width of the inner. The wall was battered. These phases of construction including repairs were recognised. The earliest phase consisted of a mud brick core with battered brick revetments. In the second phase, a brick concrete ramp was built against the inner face. The third phase witnessed further reinforcement of the ramp in the shape of a high platform of earth built against the inner face of the fortifications. The fortifications seem to have been built sometime in the 2nd century B.C. and remained in use till the Pala Period.[80]

Gupta Fortification

Shukranitisara, a treatise on polity, recounts vividly the forts and fortifications of the day.[81] Apart from *Vana Durga*, *Dhanva Durga* and *Parvata Durga*, described earlier, it refers to *Parikha*—fort which was surrounded on all sides by ditches (*Parikha*). *Parigha*—fort was the one protected by walls of bricks, stones and mud, *Sainya Durga* or troop-fort defended by heroes well up in *Vyuhas* (strategy) or military defence and the *Sahava Durga* i.e. the help-forts belonging to valorous and friendly kinsfolk.

It can be known from the *Kavyas* of Kalidasa that the capital cities of his time were protected by *Prakaras*,[82] *Vapralya*[83] and *Partvesthana*,[84] the gates of which were closed by huge doors having strong bolts (*Purargata*).[85] These ramparts of the city were encircled by a broad and deep ditch.[86] The empire of emperor Dilipa extended all over the earth, naturally guarded by the oceans forming the ditches all around.[87] Before reorganising his army and classifying itself into six divisions, Raghu constructed forts both within his empire and on the borders :

स गुप्तमूलप्रत्यन्तः शुद्धपार्ष्णिरयान्वितः ।
षड्विधं बलमादाय प्रतस्थे दिग्जिगीषया ।।[88]

Aditi opposed the enemies on the battle-field only yet to protect his kingdom from unexpected dangers he had constructed many forts and fortifications :

दुर्गाणि दुर्ग्रहाण्यासंस्तस्य रोद्धुरपि द्विषाम ।
न हि सिंहो गजास्कन्दी भयाद्गिरिगुहाशयः ।।[89]

In the *Malvikagnimitra* also a reference is made to fort on the bank of the Narmada river.

अस्ति देव्या वर्णावरो भ्राता वीरसेनो नाम ।
स भर्त्रा अन्तपालदुर्गे नर्मदाकूले स्थापितः ।।[90]

Town planning, forts and different sites for different men have been discussed in the *Vishvakarma Prakasa*, XI (taken from *Brahmayamala*), *Matsyapurana*[91] and *Brihat Samhita*[92] (dealing only with sizes of houses of kings, commanders, ministers, etc.,); the account seems to have been borrowed from the earlier sources.

A detailed study of the Gupta fortification, in all its aspects, has been made in *Manasara* attributed to 5th-6th century A.D. and *Vishvakarma Vastusastram*. The former only enumerates the names of the forts given in the preceeding treatises, while the latter describes some new types also. In the tenth chapter of *Vishvakarma Vastusastram* the construction of the fort is described. The forts were of 12 kinds based on the site chosen. *Giri Durga, Vana Durga, Salila Durga* (water fort), Desert forts are the same as referred to earlier. The fifth type was a *Daivata* i.e. natural—a place in which formations like rampart have been formed by nature :

क्वचिद्भधरमार्गेषु नद्यास्तीरादिषु स्थलम् ।
सहजागाधपरिखासंवृतं तत्तु दैवतम् ॥[93]

The next three types were built on the banks of rivers or along sea-coast. They were provided either with a single gate, two gates or four gates as safety permitted ; hence called *Ekamukha, Dvimukha* and *Chaturmukha*, respectively :

कूटकोष्ठादिसहितमनेकाट्टालसंयुतम् ।
एकानन्तु प्राङ्निष्ढं द्विमुखं दक्षिणोत्तरम् ॥
चतुर्वस्त्रचतुर्दिक्स्थं दुर्गस्यास्य विधीयते ।
दृढार्गलसमोपेतकवाटद्वयशोभितम् ॥[94]

The ninth was called a tortoise fort (*Kurma Durga*). It was generally intended as a trap for the enemy. The site was either the middle of a forest or the foot of a hill. It was provided with concealed approaches and spring traps worked by concealed machinery. This was constructed at short notice to entrap the enemy and was demolished soon after :

प्रलोभनाय शत्रूणां स्तम्भनाय च युक्तितः ।
वनमध्ये गिरेस्सानौ कल्पितङ्कूर्मदुर्गकम् ॥[95]

The tenth was *Yuddha Durga* (battle fort). It was a well defended place of safety for temporary rest in the midst of a fierce battle :

भूपालैर्देशसीमान्ते दुष्प्रवेशस्थलेऽनथा ।
युद्धार्थं कल्पितं दुर्गं युद्धदुर्गमितीर्यते ॥[96]

The *Prabhu Durga*[97] was same as other forts with structures in the walls for sounding alarm when necessary. Such structures were known as *Karnas* (ears of the forts).[98]

The fortification of the palace has also been dealt with. The doors of the gate were secured with double latches. The gateways were surmounted by towers with construction on either side to serve as an armoury for the guards. The ramparts had small abutting turrets to ward off enemies, cylindrical hollow towers in several places both for strength and for ambush. The erection of forts had been regarded as one of the foremost duties of the monarch :

दुर्गाणां स्थापनं प्रायो भूपानामात्मरक्षकम ।
तस्माच्छिल्पिगणैः कार्यं न तत्र नगरादिकम ॥[99]

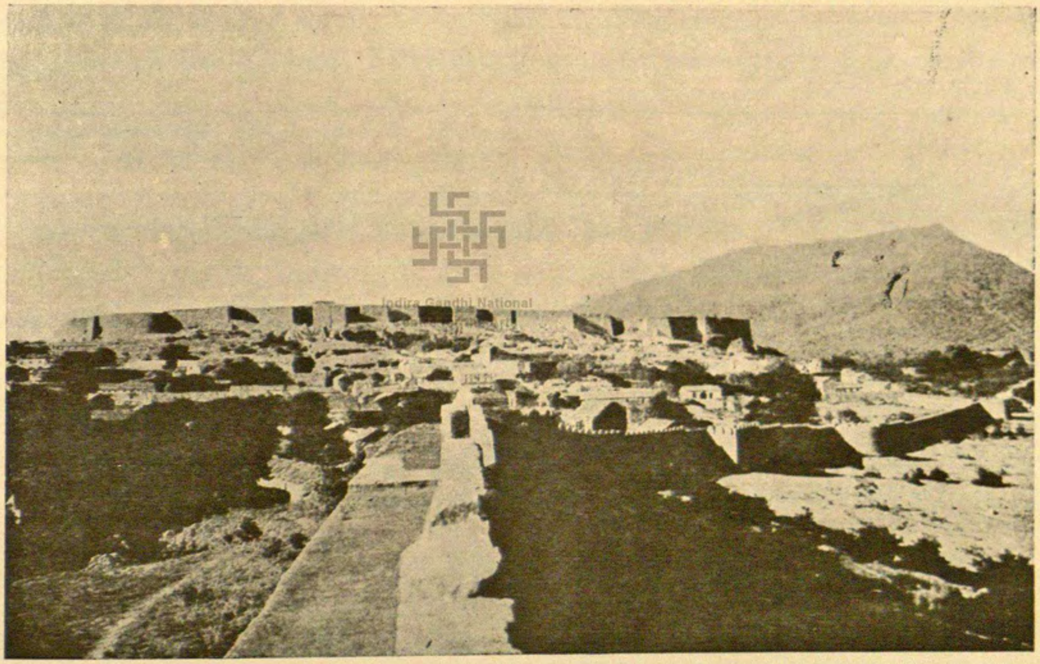
In the *Manasara*, the encyclopaedia of Hindu architecture, the forts have been called *Sibira, Vahinimukha, Sthaniya, Dronaka, Sambidha, Kolaka, Nigama* and *Skandhavara.* But these seem the names of the fortfied cities and not a type.[100] For purely military purpose they have been classified further as *Giri Durga, Salila Durga, Parikha Durga, Ratha Durga* (chariot fort) and *Misra Durga* (mixed fort).[101] Their common features have been described as :

सर्वेषां अपि दुर्गाणां वप्रैश च परिखैर व्रितम् ।
प्रवेश-निर्गम-स्थाने द्वारैरपि समन्वितम् ॥
इश्काति-कृतं वप्रं द्वादशकोच्छ्रयम ।
तद्-अर्धं भित्ति मूले तु संचारैः सह विस्तृतम् ॥[102]

i.e. All the forts were generally surrounded with strong walls and ditches. The walls were made of brick, stone and similar materials, both at least twelve cubit in height and thickness at the base was at least six cubits. They were also provided with watch-towers.

Interestingly, the accounts left by Hieun Tsang also give the idea of the forts known to him. He observes that all the towns of his period, however small they might have been in their size, were often enclosed by walls. The Chinese pilgrim says, "The towns and villages have inner gates, the walls are wide and high.........The earth being soft and muddy, the walls of the town are mostly built of bricks and tiles."[103]

The superior know-how and techniques of earlier period were solid landmarks for coming generation to learn and improve. The gigantic massive, impregnable forts of the early and late medieval India were mostly based on these principles.



FORTRESS OF UPARKOT, JUNAGADH (GUJARAT)

Reference

1. B.C. Dutt, *Town Planning in Ancient India*, 'chapter city as the expression of civil life'.
2. *Ibid.*
3. R.E.M. Wheeler, *Ancient India*, No. 3 (Jan. 1947), pp. 58-120.
4. S.M. Shastri (ed), *Ancient Geography of India* (Calcutta, 1924), p. 242.
5. C. Masson, *Narrative of Various Journeys in Balochistan, Afganistan*, etc. I. (London, 1842), p. 452.
6. A. Burns, *Travels into Bokhara, III* (London, 1834), p. 137.
7. Mackay, *Further Excavations at Mohen-jo-daro, I* (Delhi, 1938), p. 4.
8. Wheeler, *op. cit.*, (1947), p. 64.
9. *Vedic Index of Names and Subjects* (London, 1921) I, p. 538.
10. *Rigveda*, XX, 7.
11. *Ibid.*, II, XIV, 6 ; II. XIX. 6 ; IV. XXVI, 3
12. *Ibid.*, IV, XVI. 13.
13. Macdonell and Keith, Vol. I, pp. 356, 539.
14. Wheeler, *op. cit.*, (1947), p. 82, also see Mackay, *op. cit.*, p. 94.
15. Acharya, *Manasara* or *Encyclopedia of Hindu Architecture*, Vol. VII (1946), p. 227.
16. *Rigveda with commentaries* (ed) by Vishwa Bandhu, Vol. I (1965), p. 415.
17. *Rigveda*, I. 58.8.
18. Quoted by T. Bhattacharya, *A Study on Vastuvidya* (1963), p. 16.
19. Macdonell, *Sanskrit Literature*, p. 158
20. T. Bhattacharya, *ibid.*, p. 16.
21. *Yajurveda Grhya Sutras*, Parksara III. 4.2 ; *Hiranyakesi Grhya Sutra*, 1.8.27 quoted by Bhattacharya, p. 31.
22. *Taittriya Samhita*, VI, 23, 1 also see *Kathaka Samhita*, XXIV. 10 and *Maitrayani Samhita* III. 8. 1.
23. Whitney tr., *Atharvaveda*, pp. 435-6.
24. Pischel and Glender, *Vedischi Studien*, I. XXII, XIII.

25 *Devi Purana*, Chapter 72, stanza 27.

26. B C. Dutt, *Town Planning in Ancient India*, p. 87.
27. *Brahmand Purana*, Second *Anushangapad*, Part I also see *Matsya Purana*, 10.32 ; 217. 6-8 ; V. I. 6-18 and *Vayu Purana*, 8.98 ; 45. 128. For dates of the *Puranas* please see V.R. Ramchandra Dikshitar, *The Purana Index* (1952), Vol. I, pp. I-XXXIV (Introduction).
28. *Ramayana*, VI. 3.
29. *Ramayana*, VI. 3.
30. *Ibid.*, *Lankakanda*, Sarga 3. VI. 20, 22.
31. *Mahabharata*, *Shanti Parva*, 12.87.5.
32. *Ibid.*, 12.87.6 and *Mahabharata*, *Shanti Parva*, ed. S.K. Belvalkar (1961), Part I, Vol. 13, p. 412.
33. *Ibid.*, *Shanti Parva*, 12.87.13.
34. *Ibid.*, *Adiparva*, 209.29.32. Pratap Chandra Roy 2nd. ed. *Mahabharata*, Vol. I (*Adi parva*), pp. 463-4.
35. *Ibid.*, III. 283,

36. *Ibid.*, XII. 69.
37. *Ibid.*, I. 209.
38. T. Bhattacharya, *Ibid.*, p. 46.
39. *Manu Smriti*, VII, 70, etc.
40. E.B. Cowell (tr.), *The Jatakas*, Vol. I, p. 316.
41. *Ibid.*, Vol. IV. (1901), p. 68.
42. *Ibid.*, (tr) Vol. III (1877), p. 2.
43. *Ibid.*, Vol. VI (1907), p. 30.
44. *Ibid.*, Vol. VI (1907), p. 156-245.
45. Rhys Davids, *Buddhist India* (1903), p. 63.
46. *Ibid.*
47. Percy Brown, *Indian Architecture*, 2nd edition, p. 4.
48. *Ibid.*, p. 5.
49. R.K. Mukerji, *Chandragupta Maurya and His Times* (1960), pp. 220-1.
50. Sris Chandra Chatterjee, *Magadha Architecture and Culture* (1942), pp. 2-3, Pls. I, fig. 3, IV, fig. 7. For more references see A. Ghosh, *Ancient India*.
51. Percy Brown, *op. cit.*, pp. 5-6.
52. Curtius quoted by McCrindle, p. 195 and Mukerjee, *op. cit.*, p. 220.
53. J.W. McCrindle, *Ancient India as Described by Megasthenes and Arrian* (1877), p. 67.
54. *Ibid.*, p, 119 and Mukerjee, *op. cit.*, p. 220.
55. *Ibid.*, pp. 145-9 (Arrian) and *Ibid.*, p. 220.
56. Arrian, *Ind.* Ch. X and Rhys Davids, *op. cit.*, p. 262.
57. Archaeological Survey of India Annual Report (1912-13).
58. Vachaspati Gairola (tr.), *Arthasastra*, 19, 3, 1 (1962), p. 130.
59. R. Shamasastry, (tr.) *Kautilya's Arthasastra*, 4th. ed., p. 50.
60. *Ibid.*, p. 50.
61. *Ibid.*, p. 51.
62. *Arthasastra*, 19, 3, 1 and Gairola, *op. cit.*, p. 105.
63. Shamasastry, *op. cit.*, p. 52.
64. *Arthasastra* 20, 4. V and Gairola, *op. cit.*, p. 110.
65. Shamasastry, *op. cit.*, p. 53.
66. *Arthasastra* 20, 4, 3, V and Gairola *op. cit.*, p. 113.
67. *Arthasastra* 20, 4, 1.
68. *Ibid.*, 20, 4, 3.
69. Percy Brown, *op. cit.*, p. 6.
70. B.N. Puri, *Cities of Ancient India* (1966), p. 2.
71. *Ibid.*, p. 19.
72. *Ibid.*, p. 46.
73. *Ibid.*, p. 120.
74. *Indian Archaeology* 1966-7—*A Review* and Puri, *op. cit.*, p. 120
75. John Marshall, *Taxila*, Vol. II and *Ibid.*, p. 114.
76. B.B. Lal, *Ancient India*, Vol. 5.

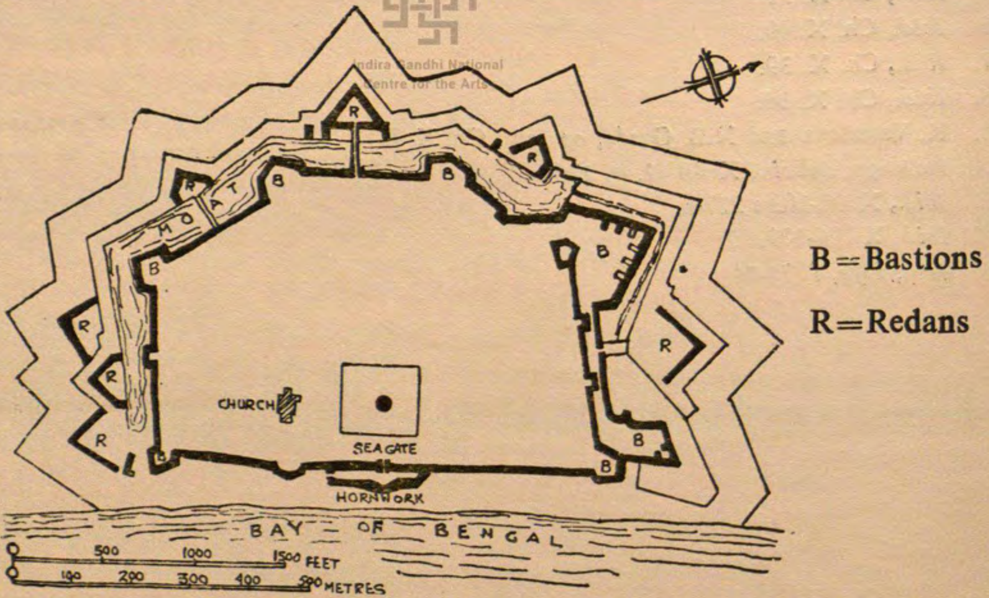
77. *Ibid.*
78. *Indian Archaeology—1957-8—A Review*, p. 586.
79. *Ibid.*, 1962-63, p. 4, Pl. X, A-B.
80. *Ibid.*, p. 4.
81. Jivananda Vidya Sagar (ed.), *Sukrnitisara*, Ch. IV. Sect. VI, VV, 2-16, 23-28, p. 447 f.
82. Kalidasa, *Raghuvamsa*, XII, 71.
83. *Ibid.*, 1, 30.
84. *Ibid.*, XI, 52·
85. *Ibid.*, XVIII, 4.
86. *Ibid.*, XII, 66.
87. *Ibid.*, 1, 30.
88. *Ibid.*, IV, 26.
89. *Ibid.*, XVII, 52.
90. *Ibid.*, *Malvikagnimitra*, I, p. 22.
91. *Matsya Purana*, 217. 1 to 19 ; 254. 14 to 34.
92. *Brihat Samhita*, 52.4-10.
93. K. Vasudeva and N.B. Garde, (ed.) *Visvakarma Vastusatram* (1958), ch. X, 16, p. 36.
94. *Ibid.*, Ch. X. 28-29.
95. *Ibid.*, Ch. X. 31.
96. *Ibid.*, Ch. X. 40.
97. *Ibid.*, Ch. X. 39.
98. *Ibid.*, Ch. X. 35.
99. K. Vasudeva and N.B. Garde, *op. cit.*, Ch. X, I.
100. Acharya, *op. cit.*, X. 40-42, p. 226.
101. *Ibid.*, X. 90-103 : 227-8.
102. *Ibid* , X 106-109.
103 Beal, *Life*, *I*, 73-74.

FORTIFYING THE FORTS

Selection of the site for the construction of a fort was of utmost importance. Naturally a place affording natural protection like rivers, thick forest, high and thorny bushes was preferred.

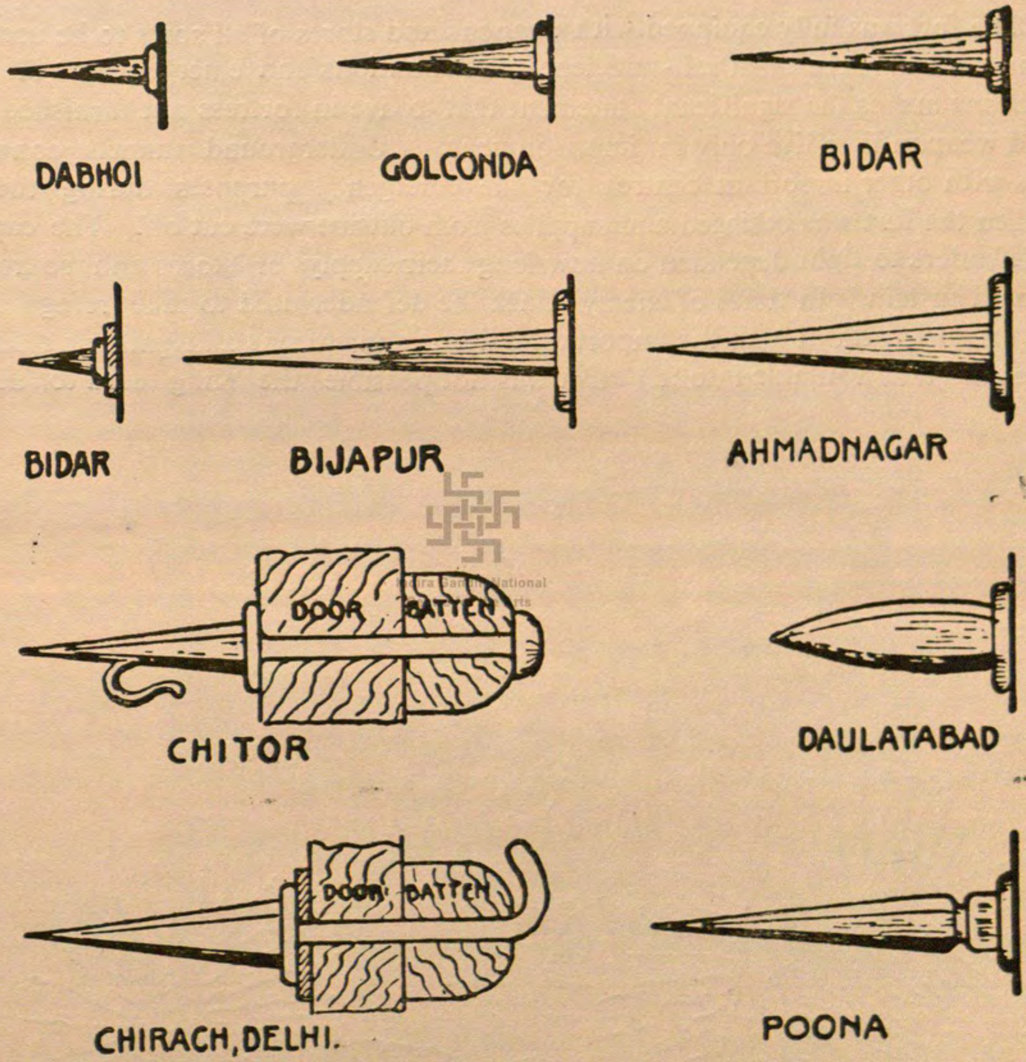
In the early days, occupying or losing forts meant virtually the winning or losing the battle.

It is emphasised once and again that the forts should naturally be well guarded by water, forests, hills, rocks or thorny bushes. Several successive moats, filled with creepers, sharks and crocodiles, were constructed. Pointed and sharp spikes of various kinds were fixed in the bottom of the moats thus obstructing crossing by the enemy. The walls of the forts were defended with fire-throwing implements and guns and dangerous engines. There were bastions and ramparts upon which were posted armed and vigilant soldiers round the clock. Occasionally guard rooms were built to watch the enemy from a far off distance without being seen.



Fortified fort (after Sydney Toy)

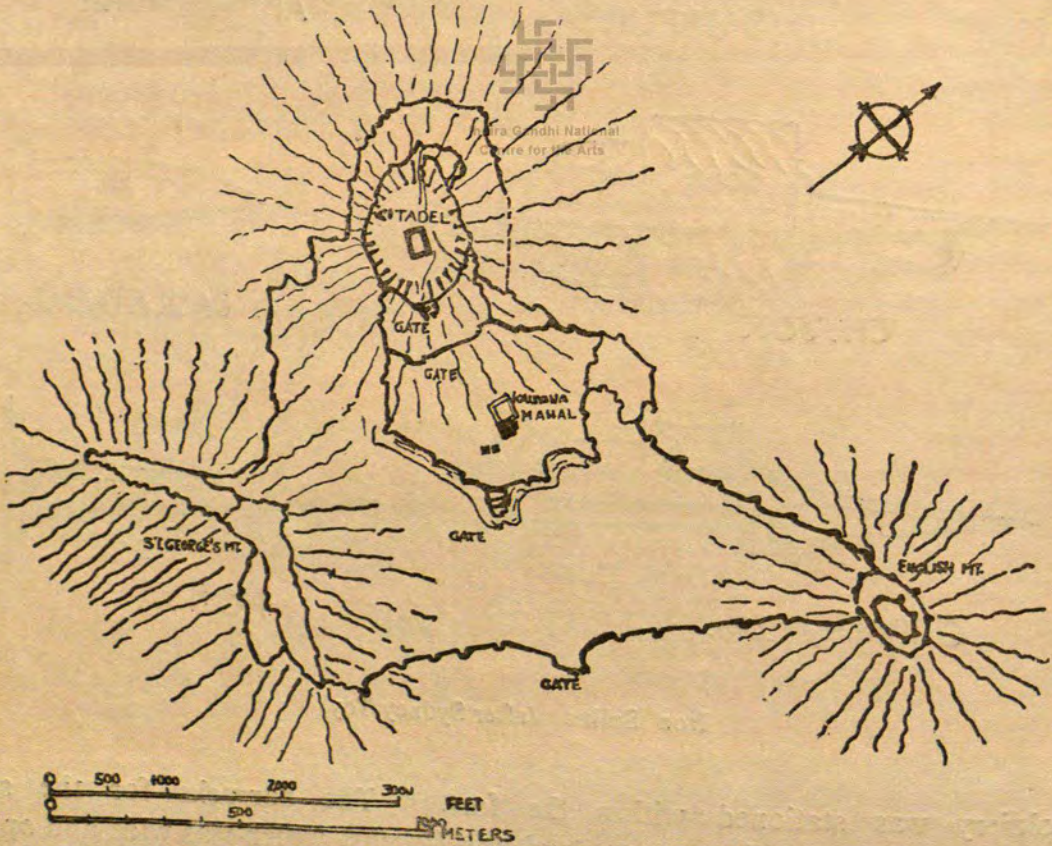
The gateways were made of double doors securely fastened by strong bolts and fitted with pointed iron pikes to safeguard it from the attacks of the elephants.



Iron Spikes (after Sydney Toy)

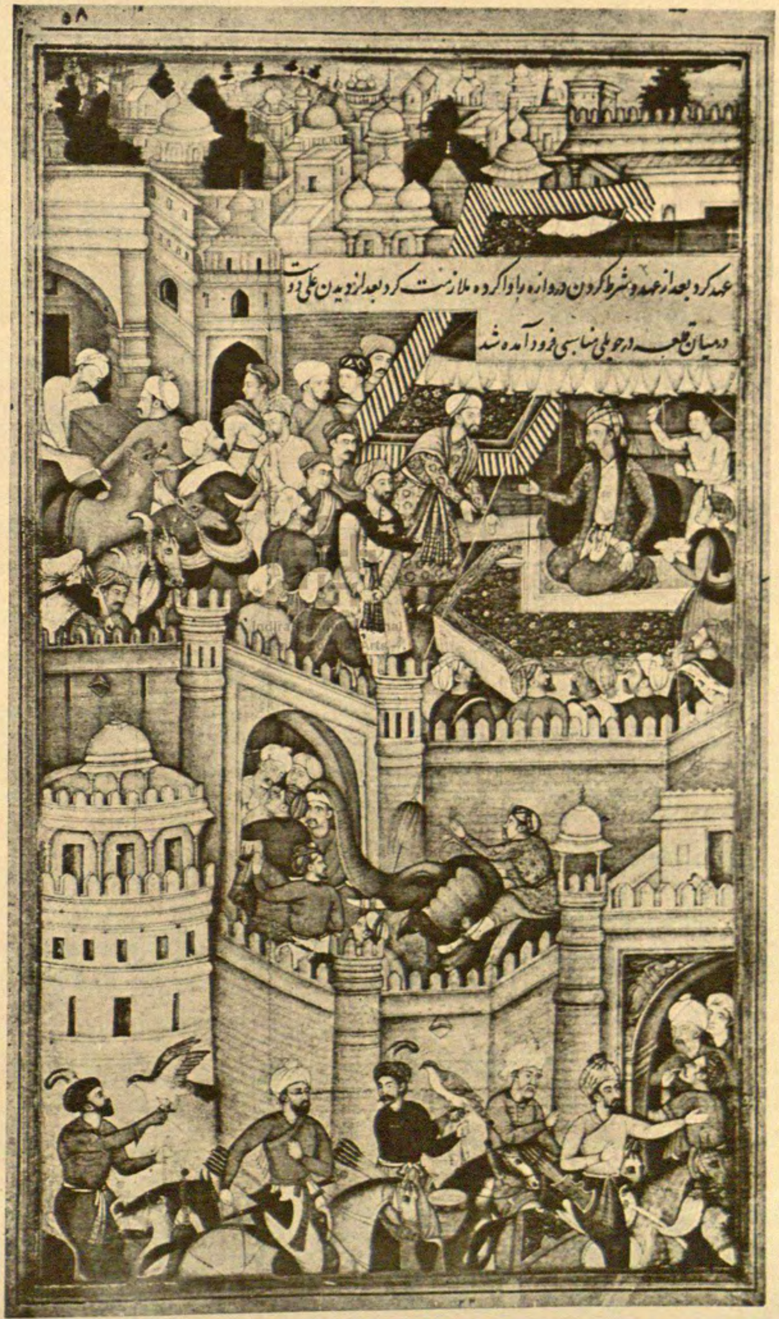
The soldiery was stationed within the fort. The barracks for the soldiers were generally built in the first court (*Prathama Kaksha*) which was wide and open and in which accommodation for King's own horses and elephants was also found. The soldiers of *Shahsraghin* (one who could fight alone with one thousand) type were made in charge of the palace.[1] The fort was garrisoned with people of all classes but the number of artisans was greater since they were required to manufacture war materials.

The fort was fully equipped with weapons and stores of all sorts to be used for over years and to make them self-sufficient in all situations and emergencies (Pl. LV). *Sukranitisara* makes the significant statement that to live in fortress not furnished with food and weapon is to live only in imprisonment.[2] Underground tunnels connected the forts with other important centres for the emergency purposes during the war times when the fort was besieged and supplies from outside were cut off. The capacity of the defenders to fight depended on how long their supply of stores and sources of water could sustain. In times of enemy attack the defender used to take refuge inside the fort bringing with him all the important officials and citizens and gathering all the quantities of grain available into it.[3] If it was not possible the King used to destroy



PLAN OF GINGEE

(after Sydney Toy)


۵۸
عهد کرد بعد از عهد و شرط کردن دروازه را واکرده ملازمت کرد بعد از دیدن علی دوست
درمیان قلعه در حویلی مناسبی فرود آمده شد

A FOLIO FROM BABAR NAMA SHOWING A FORTIFIED PALACE, MUGHAL, 1597 A.D.

(Collection : National Museum, New Delhi.)

the bridges and minor forts in his own territory and set fire to the grain stores etc., so as to deprive of their use by the enemy. New ramparts were erected round his own fort on the outside. Thus barricaded by strong stone or brick walls, the defending army used to fire its guns and hurl stones and missiles on the enemy.

In the case of hill forts the scarp replaced the moat. To make the approach impossible the hill was scarped in an absolutely perpendicular line all round the main plateau. These scarps made the top position of the hill totally inaccessible. The artifical scrap generally 30′ to 40′ in height was also constructed. Gingee, Azam Tara, Sinhgada, Panhala and Sundergad forts are examples of such hill forts.

In addition to the moats and scarps several other steps were taken to prevent entry into the fort. Very narrow and difficult steps were cut for quite long distances very close to precipices. The fort of Hadsar had a very narrow flight of steps for 68 yards. Steep ascents and brisk windings aided to the difficulties of the climber. Ankai-Tankai fort has both, the stairs and the windings and was used with advantage "Underground staircases (Ghoraged), rock cut gates (Ratangad), perpendicular stone-hewn staircase (Bhirugad), tunnelled paths (Kamalgad) and trap doors that could allow only a single person to pass, were the high-lights of this preventing engineering."[4]

The *Agnipurana* specified five defects as seriously impairing the strength and value of fortress in general. These are : (A) the drying and silting up of the ditch with sand and mud ; (B) bad and neglected condition of the ramparts and towers ; (C) the continued use of old, worn out and inefficient instruments and machines of warfare ; (D) a neglected arsenal ; and (E) an insufficient garrison of soldiers.[5]

The forts were constantly repaired, the water of the ditches frequently changed, the old arms regularly replaced and new lines of defence added whenever required. Elephants, cavalry, chariots and infantry, each officered by many chiefs and subordinates, were well maintained and the boundary-guards patrolled at all hours.

With the introduction of artillery warfare these forts became vulnerable to gun-powder (Pl. LVI). Sometimes with the help of ladder or ropes forts could be scaled. Hence measures were adopted to keep the enemy as far away from the walls as possible by installing massive cannons on the bastions with a long firing range, spreading several small Pointed iron hooks before the gate and by introducing watch towers in the fort-complex. Rightly Ramchandra Pant, a shrewd Maratha Statesman, had said, "Fortresses are the very soul of the kingdom. Without forts the population becomes helpless, the country is laid bare, and is at the mercy of the invader. Hence every-body aspiring to a kingdom should bear in mind that forts are the basis of kingdom, nay, the kingdom itself. They are the nation's wealth, constitute the strength of the enemy and are the only place where a monarch could enjoy a sound sleep....... The king should not depend on anybody and should undertake the maintenance of old and construction of new forts himself."[6]

SIEGES

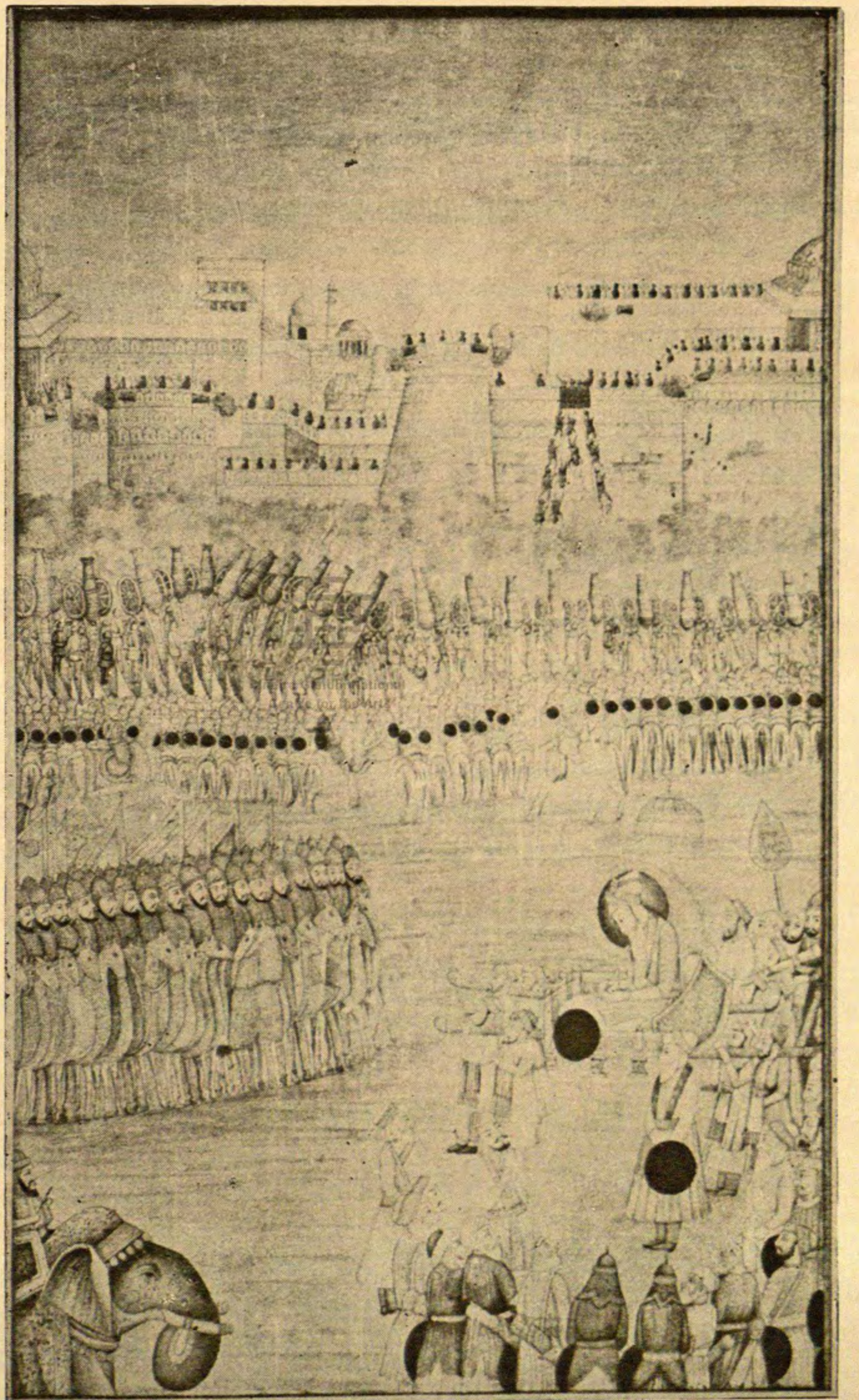
Methods recommended by Kautilya

Five methods have been suggested by Kautilya in capturing a fort. They are *Upjab* (intrigue), *Apsarp* (pretending to retreat), *Vaman* (winning over the people), *Paryupasan* (actual sieze) and *Ayamarda* (taking by assault) :

उपजापोऽपसर्पों वा वामनं पर्युपासनम ।
अवमर्दश्च पञ्चैते दुर्गलम्भस्य हेतवः ।।

Kautilya has warned that a fort should never be attacked all of a sudden but a regular procedure must be adopted. By employing fair or foul means the besieger should prepare the way for a well laid sieze. Spies should be sent, heretics and jugglers may be employed in the enemy country to make the people disloyal to their lord ; officers may be bribed and crop, water sources and stores should be destroyed. The place should be cut off from communications and all kinds of obstructions may be placed in their path. Kautilya does not deem it a sin as it is only a *Pritikriya* (reaction).[8] The *Ramayana* has similarly supported Hanuman's burning of Lanka and destroying the crop. Several methods have been recommended by Kautilya to kill the lord of the fort. The most opportune moment of attack was when the enemy was in distress, suffering from disease, was friendless or with inadequate defences.[9]

During the actual operation the ditches and the moats must be filled with earth or sand or if opportunity permitted temporary bridges to cross the moats may be constructed. The fort from all sides may be surrounded and the inhabitants inside



SIEGE OF GOLCONDA,
MUGHAL, LATE 17th Century A.D.

should be reduced by starvation and poison should be mixed in their water-resources.[10] With the help of artificial staircases, attempts should be made to reach the parapat wall and if strongly protected, machines, explosives and other materials should be used to bring down the wall by assault. In the meantime cavalry and infantry should be employed in forcing a passage through the various gateways and underground tunnels.[11] If not successful, the besieger should pretend to retreat and if chased, he should return with all his might and capture the fort. If all the attempts failed, the fort might be burnt. This was the last resort and should be used only in extreme crisis as it resulted in taking the lives of several innocent people living inside the fort :

अप्रति संख्यात प्राणी धान्य पशु हिरण्यकुष्य द्रव्य क्षयकर:[12]

Arrows spitting fire, tails of birds tied with inflammable material and many other methods recommended by Kautilya could be used to reduce the whole building to ashes. In a passage, Megasthenes mentions of a kind of boiling oil which had the power to ignite everything. This was extracted from a worm found in the Indus. Wilson takes this worm to be alligator.[13] If despite such methods the enemy instead of submitting offered a defense and there was no chance of either destroying the walls or setting fire, the besieger was recommended to befriend the enemy, watch carefully his weak points and suddenly strike him and deprive him of his fort.

The methods suggested by Kautilya were adopted throughout and a detailed and systematic study of these modes would go a long way helping a student of military science to understand this highly developed siegecraft employed by our predecessors from time to time.

Trenches & Mines

The account of Lake is quite misleading when he says, "The natives appear to be utterly ignorant of the art of conducting approaches by sap ; and generally they are also unacquainted with mining.''[14] The system was very well known and also practised. The trenches, deep and wide to conceal the workers, were dug at some distance from a fortress, the excavated earth was piled up on both the sides to increse the protection. Describing the siege of Chittor by Akbar in 1566 A.D , Farista has narrated the way these trenches were constructed, "A body of five hundred carpenters, stone cutters, blacksmiths, excavators, earth-workers and shovelmen were set to work to construct *Sabat* (trenches) which are peculiar to India.[15] *Sabat* is the name for two walls which are made at a distance of a musket shot ; and under the shelter of planks and baskets which are held together by skins, the said walls are carried clso to the fort. Then the matchlockmen and the mine diggers come in safety, through the wide way between those walls, to the fort and there they dig a mine and fill it with gun powder."[16] The same description of Farista has been corroborated by Nizam-Uddin who says, "The *Sabat* which began from the emperor's entrechment was so wide that ten horsemen could side abreast along the bottom of it and so deep that a man seated on elephant, holding a spear in his hand, could go along it."[17] Akbar used it at the siege of Chunar also.[18] Shershah in his siege of Kalinjar 1545-6 A.D., had constructed such *Sabat* (*Suranga* or mines) and again when he was trying to dig a mine at the siege of Budeon in 1555-6 A.D., he was defeated and the besieged restored to counter mining. The Marathas, too, employed these methods but their trenches were mostly open. At the siege of Gurdaspur in 1715 A.D., of Allahabad in 1719 A.D., and of Agra (August, 1719 A.D.), these techniques were adopted. These were resorted to by the Indians as far back as 1857 A.D. in the siege of Lucknow.[19]

Filling up of the Ditches

As most of the forts were strongly protected by ditches, sometimes more than one, the besieger always tried to fill it up with earth or sand or at times built temporary bridges to cross it. Sandbags were used by Aurangzeb in his siege of Golkonda in 1685-6 A.D., and by Sikhs in 1710 A.D., in the siege of Rahun in Jullunder.[20]

Siege-Towers

Siege-towers were built of timber, fully covered and mounted on wheels or erected on the ground. They were two or more storeys high and from the top storey men fought on a level with those on the battlements of the fortress.[21] Towers were both movable and stationary. One such immovable tower (called *Siba* in Persian) each was built by Dara Shikoh when besieging Kandhar in 1653 A.D.,[22] by Aurangzeb in the siege of Golkunda 1687 A.D., by assilants against French Commander Bussy in the operation of Char Mahal at Hyderabad in 1756 A.D., native besige of Arcot against Robert Clive in 1761 A.D., and by the inhabitants under the leadership of Sardar Khan of Tellicheri (Malabar) against the English in 1782 A.D.[23] An interesting account of a siege-tower used in the siege of Gurdaspur has been recorded by a contemporary writer, "At a distance of two arrows flights, batteries were erected of a size sufficient to allow of the guns being worked. They were about 4½ feet in height and in shape like bastions. A constant fire was kept on both sides. Whenever a gunner showed his head above the top of the earthwork, he would be fired at by one of the Sikhs concealed behind the battlements. In the same way a head showing above the wall was immediately fired at. The Sikhs answered shot for shot, and the imperialists were unable to move out to an attack in the open. Then at the battery of Arif Khan, Abdus-Samad Khan prepared a tower overtopping the fort wall and mounted his guns upon it. This device disconcerted the besieged, as the interior of the fort was now commended and their movements thereby hampered."[24]

Movable towers were used by the Sikhs attacking the town of Jalalabad in 1710 A.D. The movable wooden mantlets, mounted on ordinary cart wheels, were brought close to the wall and from them bullets and arrows were showered upon the besieged.[25]

Scaling[26]

Both Babar and Humayun had to use rope ladders. Again they were used in Shah Jahan's reign in the siege of Urchhah (1634 A.D.), by the besieged in Allahabad against Haider Quli Khan in 1719 A.D., and by the Sikhs in 1710 A.D., in the siege of Jalalabad.[27] About Daulatabad, Ibn Batuta says that access to the upper parts was gained by a 'leather-ladder' hung from above and taken up each night.

Reduction by starvation

Many instances of surrender due to starvation may be mentioned. All the political thinkers of the past were conscious of this fact and therefore, they had not only recommended the construction of store houses but have given detailed lists of the items to be stored and in such quantity that they might be used for years on end. We would hardly find a fort without ample provision of stores and water. In 1706 A D., the Marathas had to surrender the fort of Sinhgad to Aurangzeb, in 1749 A.D., the King of Satara had to surrender his Satara fort to the Marathas, in 1715 A.D., Gurdaspur was reduced and Sikh leader Banda surrendered – all on account of starvation. It is said that the Sikhs under Banda gathered the leaves, tender shoots and the bones of animals as a substitute for food. The fort of Bharatpur was similarly captured by Raja Jai Singh in 1722 A.D., when Chudaman was made to starve along with his army. Baji Rao, fighting for Chatrasal Bundela, forced Muhammad Khan Bangesh in 1729 A.D., to make terms and evacuate the fort of Jaitpur in Bundelkhad by starving the enemy.

Use of Elephants

Elephants were also used to batter the gates of the fortified places.[28] Kautilya designated such elephants as *Nagarayana* i.e. capable of destroying the towns.[29] That these animals were used for demolishing the fort walls is evident from the *Indika* of Ktesias. In ancient and early medieval periods elephants were frequently used to smash the gates. It was for this reason that most of the Rajput and Mughal and a few Maratha forts were protected by metal plates and spikes. Out of six, three gateways of Kohlapur fort were built of stout wood bristled with long iron spikes to keep elephants off. To counteract these, the elephants were provided with a frontlet of steel. An instance at Arcot in 1751 A.D., may be mentioned. "When the parties who attacked the gates drove before them several elephants who, with large plates of iron fixed to their foreheads, were intended to break them down; but the elephants wounded by the musquetry soon turned and trampled on those who escorted them."[30] These elephants were specially trained for this purpose. At a given signal from their leader these animals rushed impetously towards the wall and hit it with their heads forcefully. In the Valmiki *Ramayana*[31] we find mention of several thousands of monkeys, under their leader, making an onslaught against the gateways of fortified Lanka. As early as 6th century B.C., Ajatshatru, the King of Magadha, used *Mahashilakantaka* and *Ratha-musala* both being machines hurling stones against the enemy. These machines might have been used for siege operations as well.

Battering Rams

The Arabs were definitely familiar with some kind of substance resembling gun-powder and Ibn-i-Khaldoon states that Sultan Abi Yussouf of Morocco employed in the siege of Sajalamasa in 1273 A.D., a machine which used gun-powder. Farishta says that *Top* (cannons), *Tufang* (muskets) and *Gulula-i-Tufang* (bullets) were used by the Deccan Sultans and mentions their use for destruction of fort as early as the time of Mahmud Shah Bhamani.[32] Akram Makhdoomee has taken *Khusk Anjir* of the time of Iltutmish to be a machine throwing stones.[33] Poet Anvari also mentions it as a weapon used for siege and according to *Bahar-i-Ajam* it was an instrument worked with gun-powder. The fact is coroborated from a manuscript *Adaa-ul-Harab was—Shajaat-Fakhr-i-Mudabhir* also.[34]

On the whole, there is a greater continuity in the history of siegecraft and even Abu-Abdullah of Lahore, a poet of later Ghaznavite period, describes of various machines. We know of *Kharak*, which was a huge structure consisting of a large heavy beam furnished with sharp iron point and slung by ropes from two perpendicular posts. A second machine was fitted with enormous head, instead of point, for battering and making a breach in the wall. The *Manjaniq* was commonly employed and it hurled at the enemy's fort, with great force, the huge piece of stones, bottles, and even scorpions and other poisonous reptiles.[35]

The use of cannons for the demolishing of the forts has been finely depicted in a Mughal painting "Siege of Golconda" datable to the late 17th century A.D. (Pl. LVI).

Unlike their predecessor the English razed to ground several forts after they were captured, thus Tankai, Alka and Palka were dismantled in 1827 A.D., Bhudargad and Rangana in Kohlapur in 1844 A.D., Samanangad (in Kohlapur) in 1818 A.D. and Sangli (in Satara) in 1858 A.D.

Having captured the forts, Kautilya suggested to show mercy to the weak and the wounded. All the enemy's soldiers must be replaced with the besieger's own men, lest the former should do any mischief. The soldiers responsible for the victory should be properly rewarded. Then the besieger should make a triumphal entry into the place with all the paraphernalia of a victor.[36]

References

1. V.S. Agrawal, *Matsya Purana-A Study* (1963), p. 209.
2. *Shukranitisara*, I, 237-57.
3. *Mahabharata*, *Santiparva*, 59, 35-37.
4. M.S. Mate, *Maratha Architecture 1650-1850* (1959), p. 67.
5. *Agnipurana*, Chapter 241, *Sloka* 28.
6. Ramchandra Pant, *Ajnyapatre*, quoted by Mate *op. cit.*, p. 60.
7. Kautilya. *Arthsastra* 13, 174-5.4.
8. *Ibid.*
9. *Ibid.*
10. *Ibid.*
11. *Ibid.*
12. *Ibid.*

13. V.R.R. Dikshitar, *War in Ancient India* (1948), pp. 249-266.
14. E. Lake, *Siege of the Madras Army* (1825), p. 14. These have been called *Sabat* in Persian. Also known as *Malchar* (Abd-ud-hamid in *Badshahnama*, I, Part 2, p. 107.
15. Muhammad Qasim Faristah (Son of Hindu Shah), *Maqalah* (Lucknow edition, 1864), ii, p. 257 and William Irvine, *The Army of the Indian Moguls* (1952), p. 275.
16. *Ibid.*
17. Nizam-ud-din, *Tabaqat-i-Akbar Shah*, fol. 209 a, Line 17 and Irvine, *op. cit.*
18. Abul Fazl, *Akbarnama* (Lucknow edition), Book I, 114, Line 6.
19. William Irvine, *op. cit.*, pp. 275-6.
20. Khwafi Khan, *Muntakhab-ul-Iubab* (Bid. Ind), (Calcutta, 1874), ii, 356, Line I and Irvine, *op. cit*, p. 278.
21. Diades, who flourished under Philip. the king of Macedonia (360-336 B.C.), claimed to have invented ambulatory towers which could be dismantled and taken about from place to place in pieces. Sidney Toy, *A history of Fortifications* (1955), p. 21.
22. M. Elphinstone, *History of India* (4th ed., 1857), p. 513.
23. *Ibid.*
24. Ghulam Muhi-ud-din Khan, *Fatuhat-namah-i-Samadi* (British Museum Manuscript No. 1870, pl. 57*a*) and Irvine *op. cit.*, p. 279
25. Khafi Khan, *op. cit.*, p, 656 and Irvine *op. cit.*, p. 278.
26. Persian name *Narduban Vide* Steingass, *Persian-English Dictionary* (1891).
27. Khafi Khan, *op. cit.*, p. 657 and Irvine, *op. cit.*
28. Kautilya has classified the elephants into four kinds in accordance with the training they are given—that which trained for war are called *Sannahya*. Military training for elephants is again of seven kinds e g. drill (*Upasthan*), turning (*Samvartan*), advancing (*Samyana*), trampling down and killing, (*Vadhavadh*), fighting with other elephants and assailing fort and cities (*Nagarayana*). These elephants were fully protected with armours. Tether posts (*Alana*), collars, bridles, leg chains, frontal fetters were the several kinds of binding instruments while mail armour (*Varma*), clubs (*Totra*), arrow bags and several machines were the war accoutrement suggested by Kautilya (*Arthsastra* 2.48.32).
29. *Ibid.*
30. William Irvine, *op. cit.*, p. 178.
31. *Ramayana Yudhakanda*, chapter 36, 75, 81-2.
32. Ferishtah, *Gulshan-i-Ibrahimi*, Vol. II, pp. 286-7.
33. Akram Makhdoomee, *Journal of Indian History*, Vol. XV, Part I, pp. 185-8.
34. *Ibid.*
35. *Ibid.*
36. *Arthsastra, op. cit.*, 13. 174-5. 4.

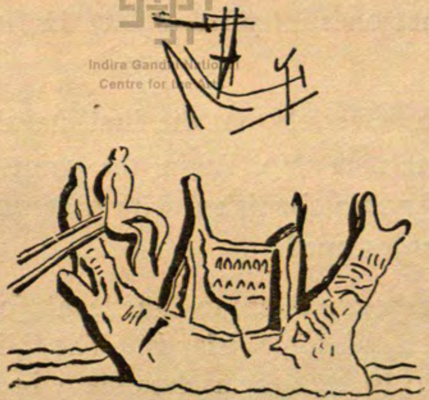
INDIAN NAVY

(From earliest times to early seventeenth century)

From times immemorial the lure of the sea has been irrisistable to man. His natural craving to discover the unknown impelled him to set out and discover new horizons in every sphere of developmental activities. This must have prompted the primitive man to make his first improvised raft for crossing the waters for fishing, carrying commodities for trade or migration. As time went by, early man, by experience, made modifications and improvement to this raft

Several representations of ships and boats are met with in ancient Indian art; the earliest one is seen on a steatite seal from Mohan-jo-daro dating back to c. 2500 B.C. The vessel though roughly portrayed yet is exceuted boldly. As the city was situated on a large and navigable river, the citizens of Mohen-jo-daro must have been builders of both boats and ships on which depended their economic prosperity.

Indira Gand
Centre for



Boats of the Indus Valley

The most important result of the excavation at Lothal (District Ahmadabad, Gujrat) in 1959-60 A.D. is the discovery of a large dockyard which attests to the water borne trade of the people there in c. 2000 B.C. Situated at the eastern end of the mound it is roughly trapezoid in plan, its eastern and western embankments are 710 feet each. Boats could enter the dockyard at high-tide through an opening in the eastern embankment.

In the Vedic period also there are references to navigation. *Rigveda* furnishes clear indications of sea going vessels. The account of the *Asvins* conveying the rescued *Bhujva* by means of "winged ships" (*Rigveda*, I, 117) has led Dikshitar to think that it may refer to "aerial navigation" in earliest times but this will be going too far and to the author it appears to be a mere poetic fancy. But in *Shatpatha-Brahmana* we do find the mention of a ship "sailing heavenwards." The maritime activities of the people of Bengal, Indus region and the Deccan plateau are borne out from literature, inscriptions and foreign accounts.

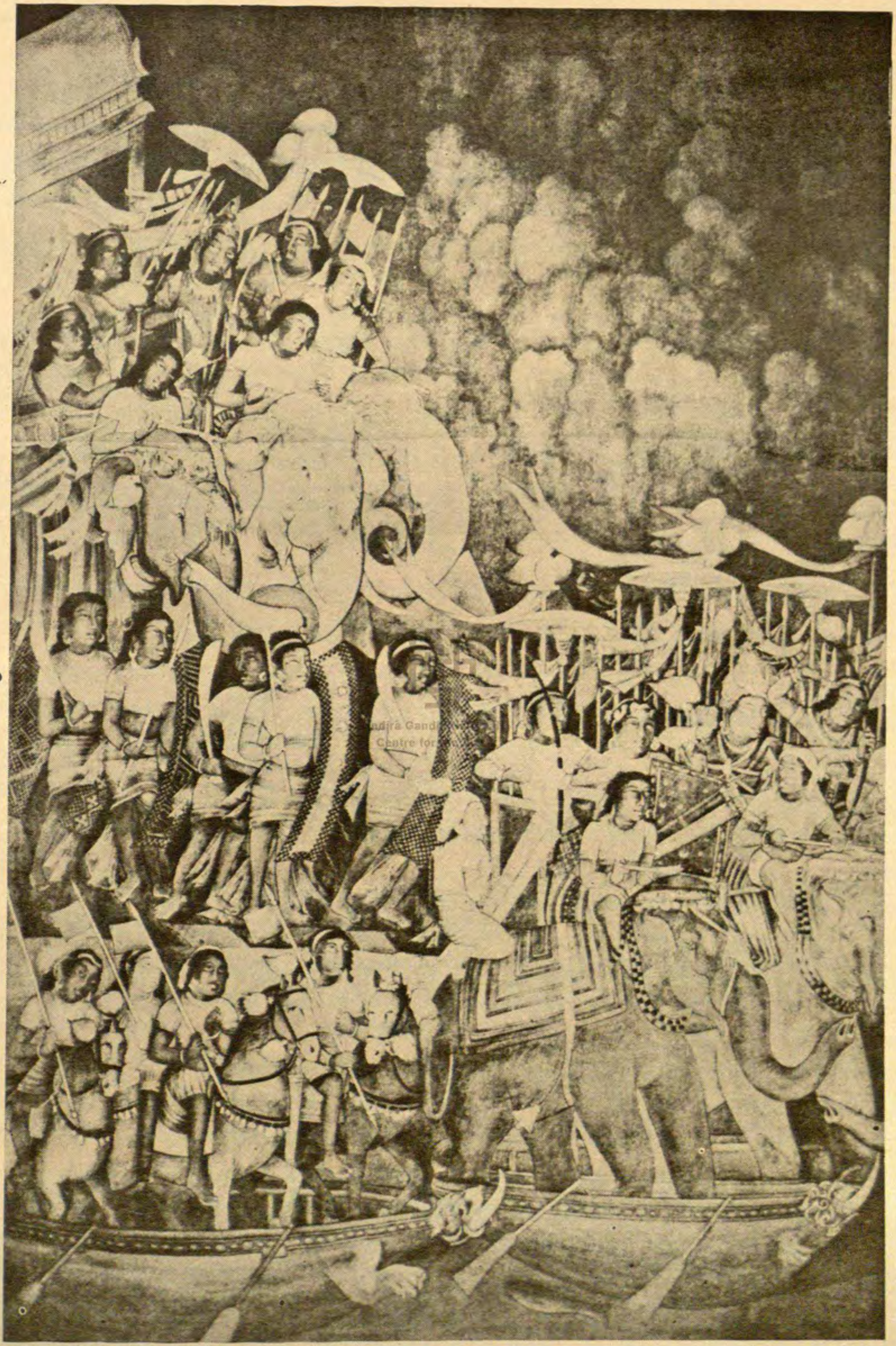
Yukti Kalpataru is a treatise on ship-building, setting forth interesting details about the various sizes and types of ships such as *Kshudra*, *Madhyama* etc. It classifies ships in 20 categories, the biggest being 176 cubit in length, 20 cubit in breadth and 17 Cubit in height and the smallest is 16×4×4 cubits, Out of the three type i. e. *Sarvamandira*, *Madhyamandira*, and *Agramandira*, the last was exclusively used in naval warfare ; former ones intended mainly for fishing, trade and recreational purposes.

It was probably in these vessels that the first naval fight recorded in Indian literature was fought. In one such ship, Tugra, the saint-king had sent his son to fight the enemy. In a similar ship, furnished with necessary equipments and weapons of war, the Pandava brothers escaped.

The great epic *Mahabharata* refers to Sahadeva's journey by sea, his war with the *Mlechchas* and occupation of some islands. The Nishadha-Raja Guhaka asked thousand of *Kaivarata* youths to keep themselves ready in five hundred ships to offer resistence to Bharata. These stray references prove beyond doubt the existence of a naval force cruising in the Indian waters.

Ship building in 325 B.C. was a flourishing industry, the stimulus must have been the result of rapid expansion of trade intercourses and ocean-traffic. Alexander's entry through Indus would have been impossible had the native boat-builders not helped him with supply of boats. A flotila of boats was used in bridging the difficult river of Hydaspes. Had Poros used the same tactics and resisted Alexander in the midstream, he could have easily dislodged Alexander's forces without much effort.

Plate LVII



VIJAYA'S ARMY CROSSING THE RIVER ON BOATS
(Wall Painting From Ajanta Cave)
VAKATAKA, 5th Century, A. D.

(Courtesy : Archaeological Survey of India.)

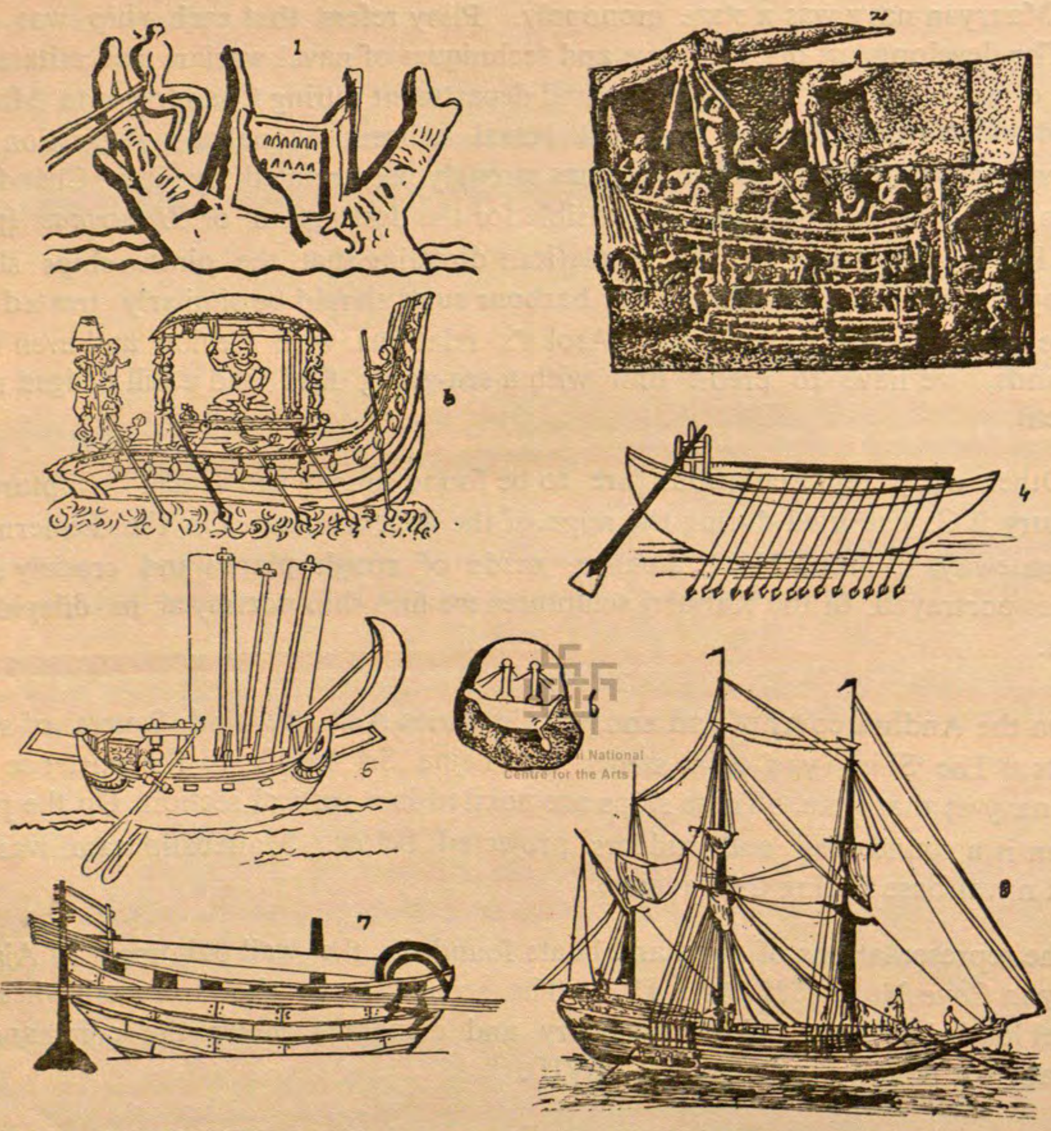
Mauryan navy was a state monopoly. Pliny refers that each ship was of 75 tons. The development of commerce and techniques of naval warfare necessitated the creation of a board of Admiralty and naval department during Chandragupta Maurya. The head was *Navadhyaksha* or Principal Naval Officer. Monahan's suggestion that *Navadhyaksha* was purely a civil officer has strongly been refuted by Ray Chaudhary. He states that *Navadhyaksha* was responsible for the destruction of *Himsrikas* (pirate ships). In the *Arthasastra* we find regulations directing that the pirate ships should be destroyed and the ships violating the harbour rules should be similarly treated. At the same time when we remember Asoka's relations with Ceylon and even more distant lands, we have to credit him with a sea-going fleet and a full fledged naval department.

Other early representations are to be found among the Sanchi sculptures of 2nd Century B.C., executed during the reign of the Satavahanas. On the Eastern and Western gateways of Stupa No. 1, a canoe, made of rough planks and crudely sewn together, is portrayed. In the Kanheri sculptures we find ship portrayed in dilapidated condition.

On the Andhra coins of 2nd and 3rd Centuries A.D, we find figures of ships with masts. The 'Ship-Type' coins struck by Yajna Sri testify to the existence of a powerful navy at that time. These ships are pointed in a vertical section. On the point of the stem is a round ball and rudders projected below. Mahabalipuram was an important naval base during their regime.

The representations of ships and boats found in the wall paintings of Ajanta are mostly in Cave No. 2 (522-650 A.D.). The second scene shows crocodile-headed large vessel loaded with the infantry, cavalry and elephants under the command of Vijaya, ready for landing in Ceylon (Pl. LVII).

The imperial Navy of Samudragupta was thoroughly organised and consisted of hundreds of ships. Chandragupta Vikramaditya vanquished the Sakas with his naval might and held sway from the Arabian Sea to the Bay of Bengal. The naval forces of Pulkeshin II attacked Puri, and reduced its glory. There are many important and interesting ships sculptured on the walls of the temples at Borobudur in Java. These come under three categories, as suggested; the first type is generally longer and broader, the second type has more than one mast and many curved ribs. There is yet another type which has a single mast and the fronts are less curved. One similar representation of the ship has been noticed in the great temple of Madurai. The Javanese Chronicle



1. Mohen-jo-daro Boat
2. From Borobodur sculptures
3. From Jagannath temple, Puri
4. Mughal *Boora*
5. From Ajanta Paintings
6. From Coins (Andhra)
7. *Patella* of 17th cent. A.D.
8. Ship (East India Company)

(after R. K. Mookerjee)

records that a ruler of Gujarat despatched a huge army in six large and hundred small vessels towards Java, conquered it and there built a town which is known as *Mondang Kumulan.*

The fascinating account of Hindu colonial and cultural expansion beyond Indian mainland and the establishment of Hindu colonies in Java, Sumatra, Malaya, Champa, Kambuja, etc., is a glorious chapter on the mobility of ancient Indian navy.

Bengal built up a naval tradition. Thrown into the arms of the sea and noted for nautical aptitude, the people of Bengal utilised their naval resources to the fullest extent (B.K. Majumdar, p. 137). Kalidasa has mentioned the naval force of the country by referring to Raghu's conquest of the Vanga chiefs and their fleet.

Epigraphic evidence proves the existence of harbours and dockyards in the 6th century A.D. A copper-plate grant of Dharmaditya (I. A. XIX, 198) dated 531 A.D., mentions *Navatakseni* or ship-building harbour. By the time the Palas became the dominant power in Bengal and Bihar, the importance of navy was fully realised and it formed a regular feature of their military operations. Three well-known epigraphic records mentioned by Majumdar may be quoted in this connection. The Khalimpur copper-plate of Dharmapala states that from his royal camp of victory at Pataliputra many fleets of boats sailed the Bhagirathi. The Kamauli grant of Vaidyadeva mentions that during the period of Kumarapala, his minister had obtained a glorious naval victory in south Bengal. The Sena king Vijayasena (A.D. 1096-1158) also led a naval expedition and advanced as far as the Ganges. Thus it is evident that the Pala kings maintained a powerful navy and exercised a good control over the sea. The Harsha inscription of 554 A.D., describes that the Gauda people had built up a naval power and left their naval traditions as a legacy to their successors, the Palas and Senas.

Most reliable information regarding some of the south Indian ports is available in the *Sangam* works. In the Chola ports light-houses were built of bricks and mortar which burnt blazing lights at night to guide ships to port. The Chola fleets did not confine themselves to the coast patrolling alone but boldly crossed the way of Bengal.

Towards the end of the 10th century southern India witnessed a remarkable outburst of activities under the strong government of the Chola kings. Raja began his career with the conquest of Chera fleet in 950 A.D. He built up a powerful navy.

Ceylon was also added to his empire in the 20th year of his reign. His son Rajendra Chola Dev I (984-1013 A.D.) conquered countless islands in the midst of the ocean. In the *Tirumalai* inscription it is recorded that he achieved a great naval victory over the king of Kadaram, by despatching ships across the stormy ocean.

Brahmana Chach, the ruler of Sindh in 637 A.D., had a very weak naval force, and consequently could not guard the Western coastal belt which was the scene of frequent piracy and was ravaged by the sea rovers.

The naval attack by the Arabs on Thana (near Bombay) and Broach was the fore-runner to the final conquest of Sindh by Muhammad-Bin-Kasim. In 712 A.D., Muhammad-Bin-Kasim landed in Debal, the famous sea-port town near Thana sea, and marched upon Nerun. He crossed the Indus by constructing a bridge of boats and ultimately conquered Sindh.

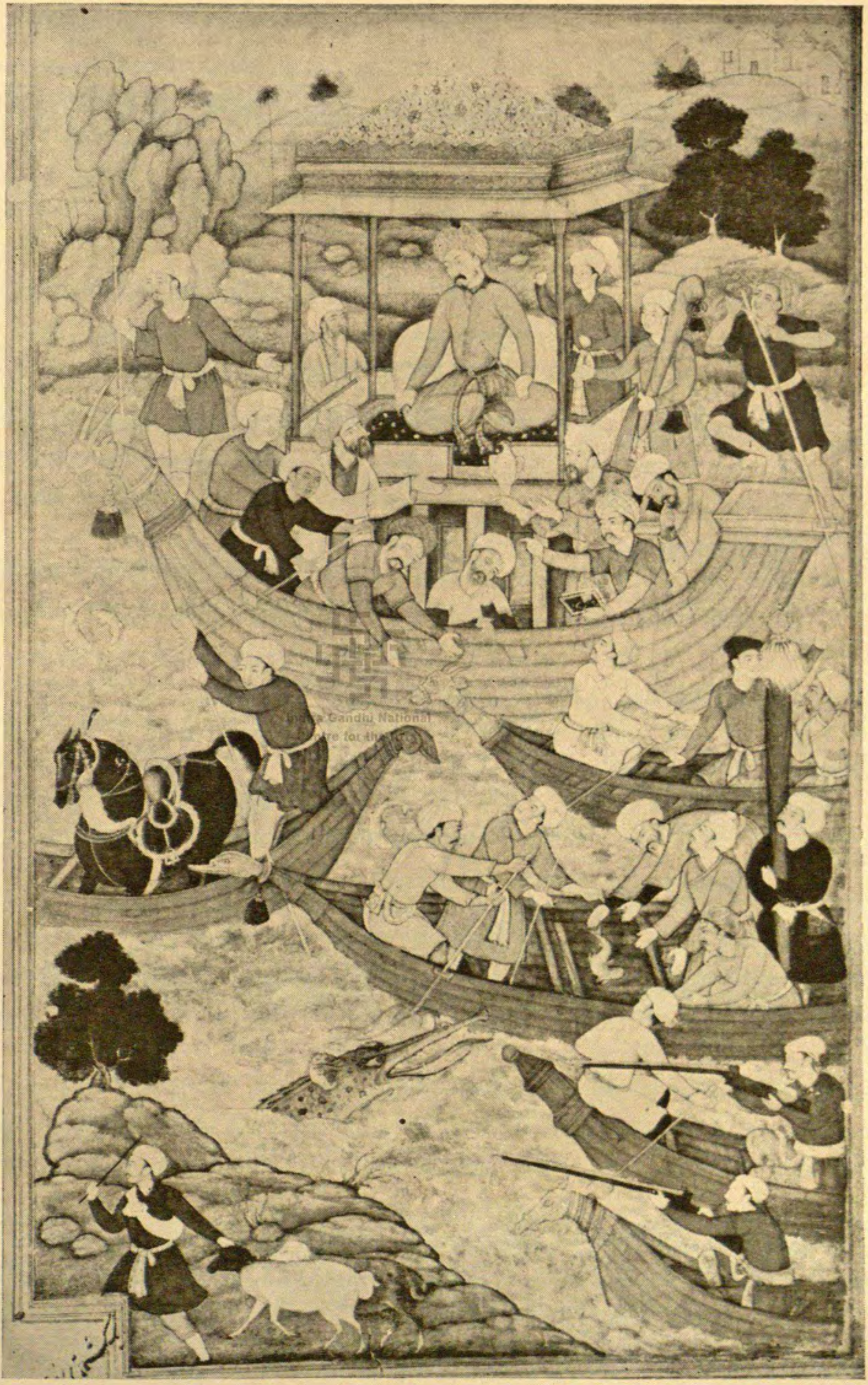
In the 11th century, the seventeenth expedition of Sultan Mahmud, was directed against the *Jats*. It was a brilliant naval fight, where the Sultan had built 1400 boats armed with three iron pikes each, so that anything which came in contact with them could infallibly be destroyed. The *Jats* launched four thousand boats and a desperate conflict ensued. Every boat of the *Jats* that approached the Muslim fleet was either damaged or broken by the projecting pikes or over-turned, ultimately resulting in a shocking defeat for the *Jats*.

One important naval expedition was directed by Balban (1266–86 A.D.) against Tugril Khan, the then Governor of Bengal. A massive fleet of boats was collected in which his army crossed the Saryu river. Tugril was put to death and an unprecedented massacre took place at Lakhnauti.

Marco-Polo has discussed in detail the construction of ships in India, their size, form, fitting and mode of repairing. In 1353 A.D., and 1360 A.D., Sultan Firoz Shah directed two expeditions against Lakhnauti and another in 1372 A.D., against Thatta. In these expeditions many barrier-breaking boats had to be embarked in crossing the river. In 1388 A.D., Timur crossed the mighty river Indus by means of a bridge of boats. He had to fight several naval battles on the Ganges. In 1521 A.D., the Admiral of the King of Gujarat defeated the Portuguese and sank one of their vessels.

Sultan Mahmud Bigara (A.D. 1459-1511) was the most equipped of the Gujarat kings during the 15th-16th century A.D. In 1507, A.D., he secured the help of Turkish troops and launched a naval attack on the Portuguese. The Muhammedan assailants

Plate LVIII



THE MUGHAL BOATS FROM BABARNAMA,
1597 A.D.

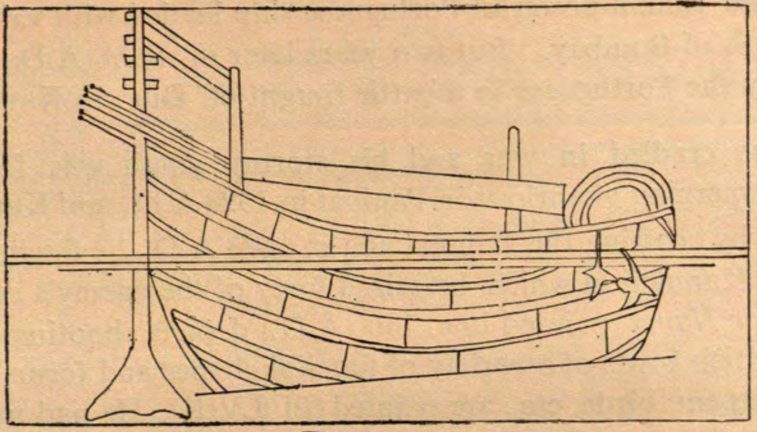
(Collection : National Museum, New Delhi.)

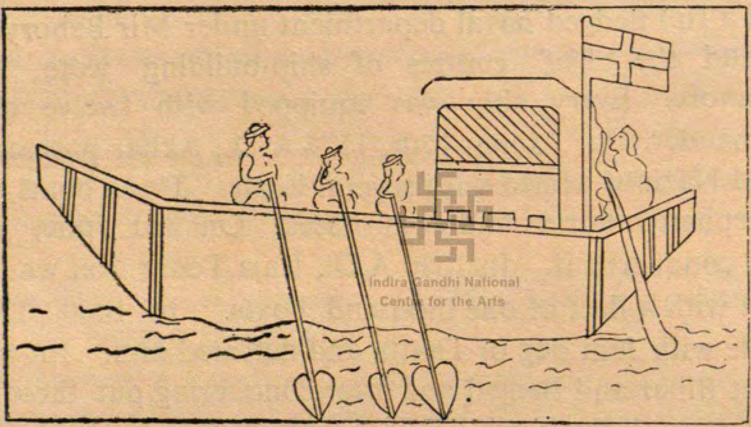
were successful and sank a powerful Portuguese ship loaded with valuable cargo, near Chamb to the south of Bombay. But two years later in 1509 A.D., the Muslim fleet was annihilated by the Portuguese in a battle fought off Diu in Kathiawar.

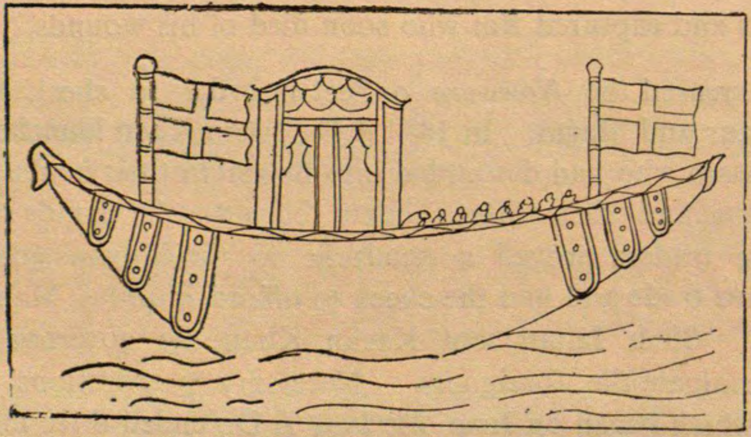
Babar was cradled in war and his stormy youth was filled with romantic adventures. After emerging victorious in Panipat in 1526 A.D., and Khanva in 1527 A.D., Babar followed up by crossing the Jamuna and in 1528 A.D., he fought a naval battle on the Ganges near Kannauj in which he seized forty of the enemy's vessels. A beautiful painting from *Babar Nama* (painted in c. 1600 A.D.) depicts shooting of a crocodile by Babar himself in which boats of a variety of fanciful shapes and forms such as the head of a horse, stag, serpent, birds, etc., are painted (Pl. LVIII). He had named some of the boats as *Asayasha*, *Arayasa*, *Gunjayasha* and *Farmayasha*.

Akbar had a full fledged naval department under Mir Bebory. The ships were of various sizes and the chief centres of ship-building were Bengal, Kashmir, Allahabad and Lahore. Every ship was equipped with twelve officers headed by *Nakhoda*, the commander. On June 15th, 1574 A.D., Akbar proceeded against Daud Khan of Patna and Nazipur armed with several boats. These boats were high enough to accommodate elephants, horses and even offices. On 3rd June, 1574 A.D., Akbar reached Patna and conquered it. In 1530 A.D., Raja Todar Mal was sent to settle the revenues of Gujarat with a fleet of one thousand boats. In 1690 A.D., Khan Saman fought a naval battle with Jani Beg of Thatta and defeated him. In 1574 A.D., Akbar expeditioned against Bihar and Bengal and after conquering put these provinces under Khan–i–Khana and gave all the boats brought with him. In 1604 A.D., Man Singh launched a second naval expedition against Kedera Rai, the lord of Sripura, with a hundred war-vessels and captured Rai who soon died of his wounds.

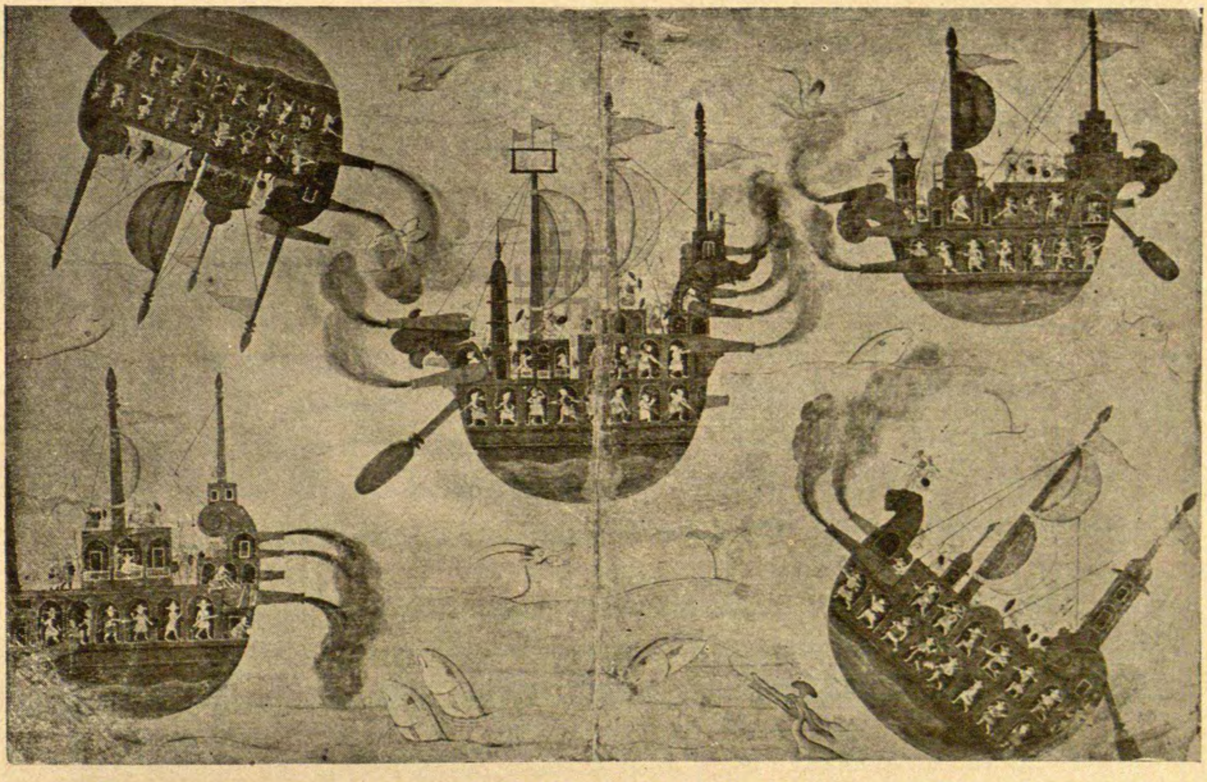
Jahangir increased the *Nowwara* or fleet in order to check the recurrence of aggression of Afghans and Magas. In 1633 A.D., Islam Khan launched a naval attack over hostiles of Assam who had descended into Bengal in their boats. Four thousand Assamese were slain and their fifteen boats fell into the hands of the Mughals Arrogant Portugese traders proved a headache to the Mughal government. They engaged in cruel slave trade and had the check to offend Mumtaj Mahal by detaining two of her maids. Shah Jahan sent Kasim Khan, the governor of Bengal, with instructions to exterminate the foreigners. Necessary preparations were made and the siege of Hugly which began on June 24, 1632 A.D., ended three months later in the capture of the place. Most of the ships were lost but a few reached Sangat island, where a pestilence destroyed a large proportion of the survivors.







17th Century Maratha Ships
From Top : Patella, Oloaka, Budgaro
(after R.K. Mookerjee)



AN INDIAN ARMADA
PAHARI, 18th Century A. D.

(*Collection* : *National Museum, New Delhi.*)

But the condition of navy was in no way good during this period, owing to the continued dilapidation of Bengal fleet, and negligence of the officers.

In 1662 A.D., during the reign of Aurangzeb the hostile force of Kooch Bihar were repulsed by Mir Zumla who had a fleet of three hundred and twenty three ships under his command. In 1664 A.D., when Shaista Khan became the viceroy; he equipped his boats with all necessary war materials.

In 1680 A.D., Shahji Bhonsale was able to achieve a naval victory over the Portuguese. Shivaji during his times was a terror and he plundered many Portuguese and British ships on the high seas. From 1694 A.D., to 1750 A.D., the Angreys established control from Malabar to Travancore and the naval history of Angreys was the history of Marathas. In 1698 A.D., Kanhoji succeeded as the commander of Maratha navy with the title of *Dariya Saranga*. The carrier of Angrey was one of long series of naval exploits and achievements; rare in the annals of Indian navy. In 1707 A.D., he attacked Bombay, in 1710 A.D., captured Khandgiri and in 1712 A.D., attacked Bombay for the second time. In 1719 A.D., the English started bombardment with certain damage but Kanhoji Maratha soon reinforced his fleet. In 1720 A.D., Portuguese and the English joined hands and burnt sixteen ships laying in the Vijay Durga river. In 1722 A.D., they attacked Kolaba but Kanhoji was more than a match for them. In 1726 A.D., Kanhoji captured the richly laden English ship 'Derby' and many other French and Dutch ships. It cost fifty thousand pounds annually to the East India Company to protect its trade from Angreys. After Kanhoji's death again Dutch fleet suffered a great loss in 1754 A.D., at Tulaji's hands, who was the successor of Kanhoji.

The Portuguese kings of fifteenth century looked with envy on the riches of India and eagerly desired to obtain a share in her profitable trade. Prince Henry, the navigator, devoted his life to the discovery of a direct sea route from Portugal to India. After his death in 1460 A.D., his adventurous captains continued the quest and on 20th May, 1498 A.D., Vasco Da Gama ultimately succeeded and anchored at Calicut. In 1500 A.D., the king of Portugal despatched a larger fleet under Pedro Alvares Cabral who established a factory and obtained good cargoes. Under the viceroyality of Almeida and Albugerque, Portuguese fleet commanded the sea but after a fierce sea fight in 1612 A.D., the British established their position and founded their factory at Surat. In 1615 A.D., the English again defeated the Portuguese at sea and their capture of Ormiz in 1622 A.D., so weakened the Portuguese power that thence forward the English had little to fear from the Portuguese and half a century after the death of Aurangzeb, when rich Bengal was also acquired, nothing could stop the masters of the sea and Gangetic valley from becoming the rulers of India (Pl. LIX).

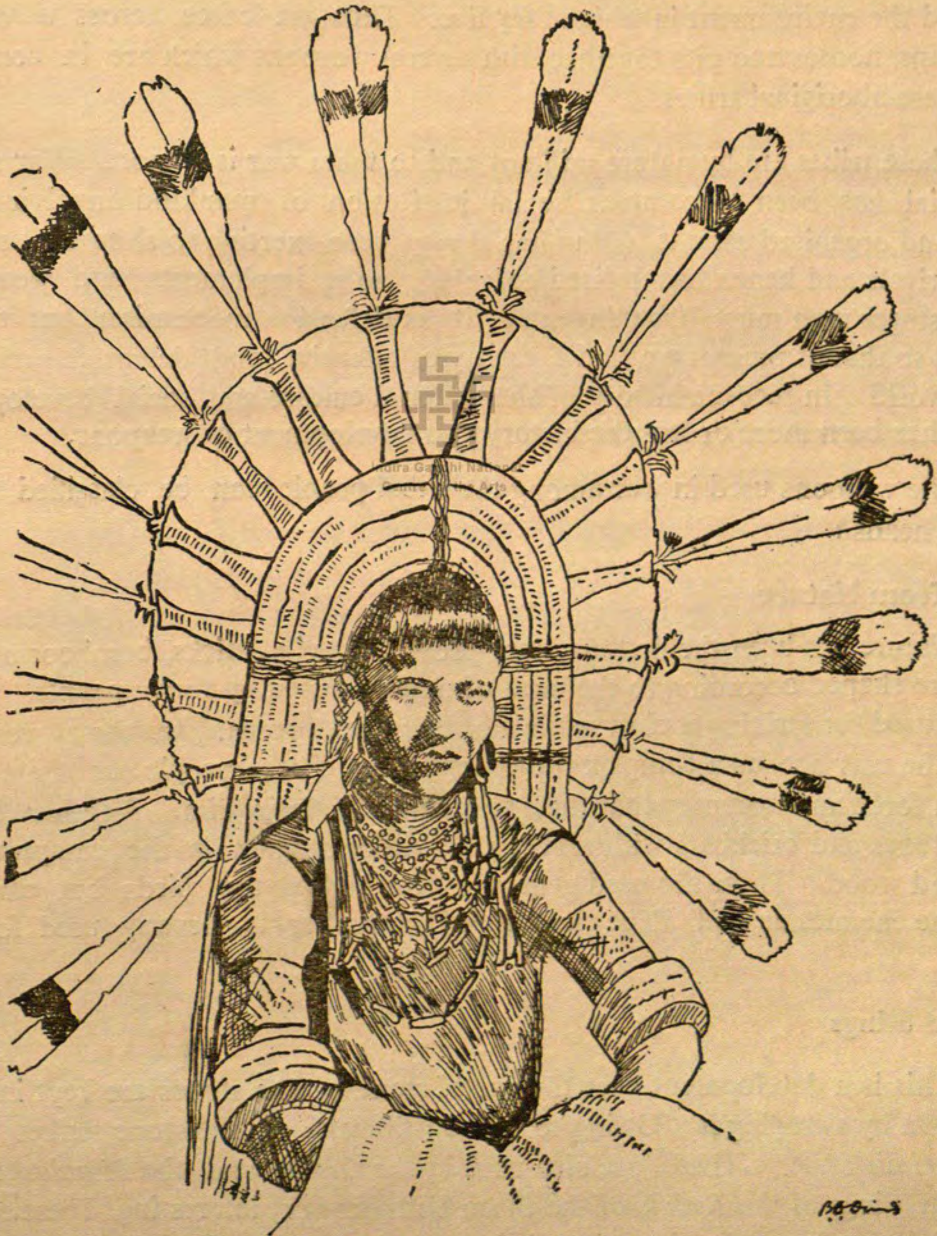
For Further Study

1. Abul Fazl Allami, *Ain-i-Akbari.*
2. Beal (tr), *Records of Fa-Hien and Sung Yen* (London, 1906).
3. Ballard, G.A., *Rulers of the Indian Ocean* (1927).
4. Bridge, C.A.G., *India and the Navy.*
5. Bernier, *Travels in the Mughal Empire* (London, 1991).
6. Curtius, Q. (tr. by T.J.C. Rolfe), *History of Alexander* (London, 1946), 2 vols.
7. Cunningham, A., *The Bhilsa Topes* (London, 1854).
8. Griffiths, J., *Paintings in the Buddhist Cave Temples of Ajanta* (London, 1896-7), 2 vols.
9. Cowell, E.B. (ed), *Jatakas* (Cambridge, 1905).
10. Stein, M.A. (tr. and ed.), *Rajtarangini* (Bombay, 1882).
11. Kalidasa Literature.
12. Shama Shastri (ed), *Arthasastra.*
13. Low, Lt. Col. C.R., *History of Indian Navy* (1613-1863), (London, 1877) 2 vols.
14. Mookerjee, R.K., *A History of Indian Shipping* (1957).
15. Sukhathankar, V.S. and others (ed), *Mahabharata.*
16. Richmond, H., *The Navy in India* (1931).
17. Smith, V.A., *Early History of India*, 4th ed. (Oxford, 1924).
18. Schoff, W.H., *The Periplus of the Erythreaen Sea* (London, 1912).
19. Kern, H. (ed.), *Brihatsamhita* (Calcutta, 1865).
20. Ramachandran, K.S., Ancient Indian Maritime Ventures : A brief survey, *Indian Mission and Missionaries : Vivekananda Commemoration Volume* (in the press).

Indira Gandhi Centre for the Arts

TRIBAL WEAPONS

India is a land of hetrogenious culture. On one hand we find ourselves engaged in manufacturing the latest type of deadly weapons while on the other hand a section of us is still living in the primitive tribal stage. Tribal population in India are at



A Warrior (after Elwin)

different economic and cultural levels. Some people are agriculturists while others are hunters. The hunters who live mainly on the flesh of the animals are naturally well acquainted with the terrain, and the animals there and the method of killing them. They possess efficient technical devices to catch and kill these wild beasts and also for their self-defence. These devices depend largely on the knowledge of technology of the people and the environment in which they live. Thus we come across a variety of snares, traps, nooses and pits together with several weapons which are in common use among these aboriginal tribes.

These tribes are by nature militant and to them war is a sport. War since time immemorial has been a complex social institution of mankind involving definite purpose and organised assault. Man has always been exerting to show his supermacy upon his rivals and hence has devised complex tools, implements and weapons. In the early stages man must have invented it as defensive mechanism but this circle continued so that at present we find a variety of offensive and defensive weapons all over the world. In fact the history of the material culture and social development of mankind has been more or less the history and development of weapons.

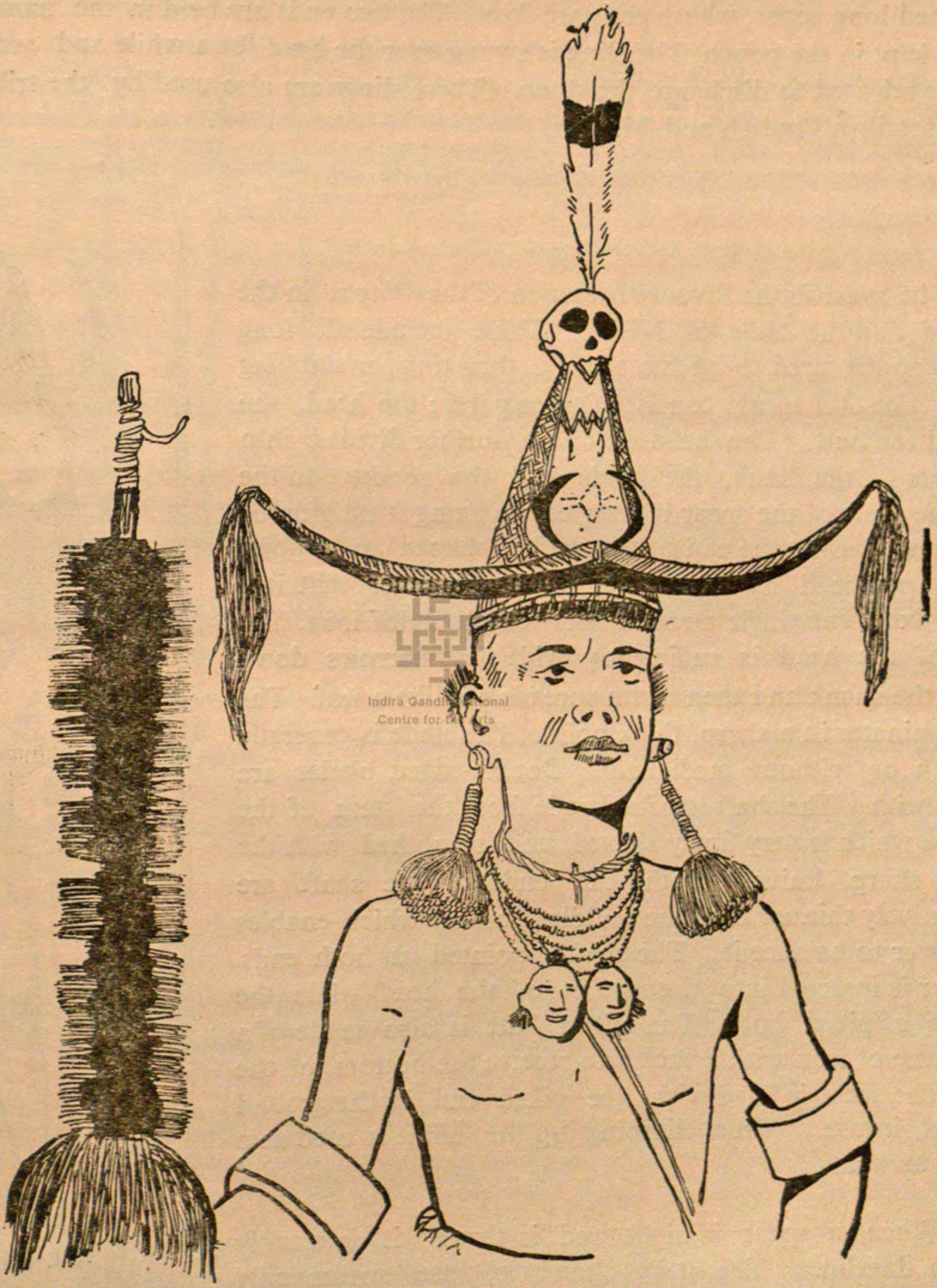
The weapons used in war among the tribal people can be classified under the following heads :

Objects from Nature

Nature has been the first armoury providing twigs, sticks, bamboos and stones. These were shaped according to the need of time and used by these people. Sticks are generally used for striking a blow while stones were thrown. In these weapons the hand of the user acts as a complex projecting lever. These people use these weapons with such force and accuracy that they seldom miss their aim. Another device for hurling stones and brickbats with more or less accurate aim is the catapult made of rubber and wood. These are used generally for killing the birds but can be used against the enemies as well. The elasticity of the rubber is cleverly used for hurling pellets.

Balas and Slings

This is a development over the use of stones. The stones are kept in the slings and thrown by swinging it. Owing to the centrifugal force the stone strikes the object at a far off distance. These are also used by the *Oranns* and the *Mundas* for killing birds. The slings of the *Reddis* of the Bison Hills are very interesting. These consist of a pouch of cloth of waste leather, cloth being very common. To the two ends of pouch



A militant Naga (after Elwin)

are attached long ropes, whose ends are free. The two ends are held in the hand and the stone kept in the pouch. The sling is swung over the head for a while and suddenly one end is released to discharge the stone. These slings are also used by the tribes in Andhra, Madhya Pradesh and Madras.

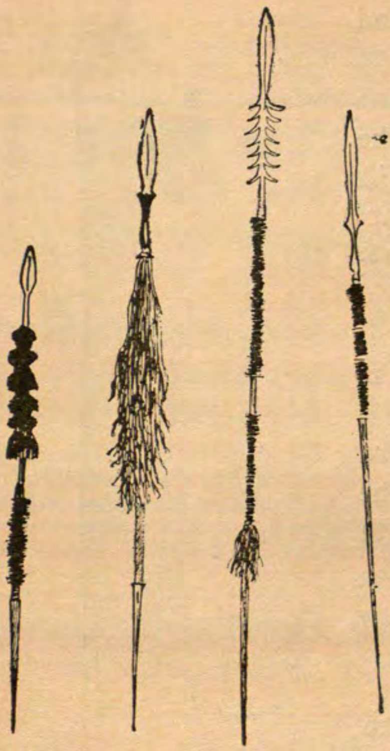
Spears

The spear is the favoured weapon of the *Nagas* in the Nagaland and the *Adis* of NEFA. These include all long hafted weapons used to pierce with a thrusting or stabbing section. The *Adi* spears consist of three parts ; the head, the shaft and the butt. The head has been further divided into three parts i.e. the shank, the blade and the socket. In the socket the shaft of the spear is inserted. In fixing it no gum or adhesive is used but the end of the shaft is shaped to a point and the spearhead is rammed in such a manner that it is strongly fixed. The single piece head is completely of iron. The socket of the head is sufficiently wide but narrows down towards the shank and then again spreads out like a leaf. The head culminates in a sharp, thick point. The blade is generally plain with or without medial rib. Double-edged blades are also met with. The shaft is often made from the stem of the palm tree which is very finely shaved and smoothed with the help of sharp knives. Both the ends of the shaft are comparatively thinner than the middle portion which enables the thrower to balance it. The shaft is pointed at both ends, the upper is inserted into the socket of the head while the lower in a piked butt. The piked butt is also made of a single piece of iron with a socket to receive the bottom of the shaft. The spear is fixed with the piked end in the ground when not in use. While climbing up the hill it is used as a support as well.

When a spear is light and is thrown it is usually called a Javelin. The *Adis*, however, use spears only for thrusting. These spears are decorated with tufts of *Yak*-hair, dyed in scarlet and fixed at the

Naga holding Spear (after Elwin)

junction of the socket of the head with the shaft. This besides being a decoration serves to stabilise the spear in its flight. These spears are also used in ceremonial dances. In the Anthropology Gallery of the National Museum, New Delhi several specimens of these are exhibited.



Naga Spears

The *Naga* spear shafts are made of *Sago palm* which is one of the hardest known woods and these spears are highly valued. The blades here are also leaf-shaped with broad and hollow sockets below to receive the shaft. These are very heavy and clumsy and are used only for thrusting and not for throwing.

The spears of the *Lhotas* are always thrown and have a range of 30 to 40 yards. These are very short with an average length of two to three feet; blades range between 10 inches to one foot.

The *Kharias* have a special spear known as *Maha Kirkorn.* These are of two types; the first is made of bamboo shaft inserted into socketted iron head and the average length is 5 feet. In the second type, the spear-head has a tang which is fixed into the bamboo.

The spears of *Tharoos*, living in the Tarai of Nepal and Uttar Pradesh, are very simple. These consist of a bamboo shaft and a leaf shaped blade with a long tang which is inserted into the shaft.

Swords

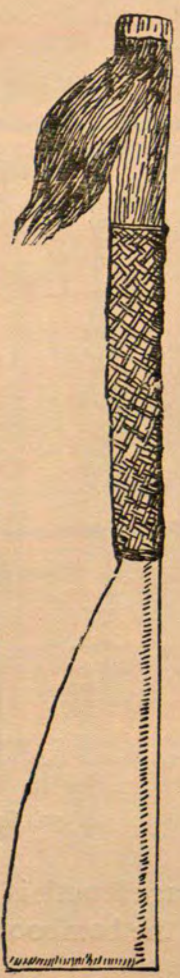
The swords are generally straight and single-edged. The hilt, without pommel and knuckle guard, is covered with plaited cane stripes so as to avoid slipping. The blade is broader at the hilt, narrow at the upper end and blunt and crescent-shaped. It is used for cutting the enemy when he is within reach. These swords are always kept in wooden sheaths covered with cloth or cane stripes. Like *Dao* these are also used by the people of NEFA and Nagaland and slung from a belt made from the *Mithun* hide.

The value of a sword is assessed on the basis of the numbers of the welding lines marked on the blade. The NEFA swords are generally imported from Tibet but the *Adis* are known for manufacturing their own swords. The price of one such sword ranges from Rs. 50 to 100.

One type of sword which is nearer to *Khanda* variety is popular with the tribes of Madhya Pradesh. The *Tharoos*, however, use *Khukari* in place of sword. A small bone, horn or metal hilt has a long spear-shaped blade curved inside. The *Khukari* is always kept in a scabbard of wood covered with cloth or leather.

Knives

Many types of knives and daggers are also known to these people. These knives are single or double-edged with sharp points. The technique is the same as that of *Dao*. The handle is wooden which is covered with plaited cane strips. The blade is kept in the wooden sheath. Long and curved knives are also met with.



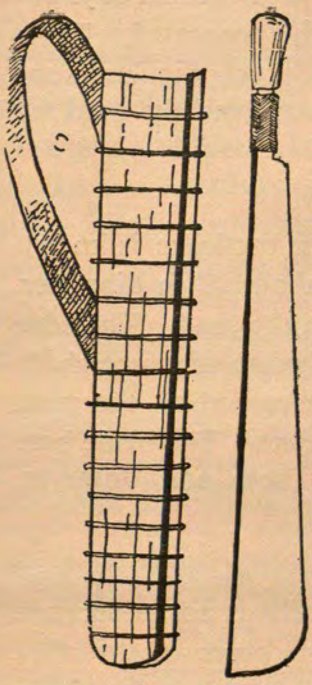
***Adi* Sword**
(after Sachin Roy)

Spike Wristlets

'Spike Wristlet' is a typical *Adi* defensive weapon. The wristlets are locally made from brass with strong sharp spikes. It is worn round the wrist and used in hand to hand fight. Wristlets with blunt spikes are used by men and women alike as ornaments.

Dao

The *Daos* serve both the domestic as well as the material purpose. The blade of the *Adi Dao* is narrower towards the tip. These are without points and are



Dao (after Sachin Roy)

heavy at the top. The blade has a tang which is inserted into the wooden shaft and plaited with cane stripes.

The *Rengma Nagas* attach much importance to their *Daos* and it is their most reliable weapon of offence. It is about 2 feet 7 inches long with iron blade extending for half of its length. The blade has slightly curved margins. The *Daos* which are of various shapes and designs exhibit their aesthetic sense. The handle is generally of rectangular wood, this is beautifully decorated with cane and then dyed in different colours.

The *Rengma Nagas* carry the *Daos* in a holder which is suspended from the waist by a harrow cotton belt. The average length varies between 2 to 3 feet. Here also *Sago palm* wood is used for the handle.

The *Flota Nagas* use *Tsonak Dao* which is axe-shaped. Another known type is *Yanthong Dao* which is very long. Here the shaft is very long with a narrow blade.

These *Daos* are mostly carried in wooden cases, one side of which is open. Several transverse cane bands keep the *Daos* in position. The sling of *Dao* is generally made of *Mithun* hide. The sheaths of *Lhota Naga Daos* are of a solid block of wood some 8″ long by 3″ broad with slit about 6″ long and are broad enough to admit the blade but the handle remains outside. The *Dao* is mostly having blade down and the holder is tied to the belt round the waist.

Warrior Carrying *Dao* (after Sachin Roy)

Club

The clubs are used for striking over the head hence the weight and the centre is shifted to the top. These are very rarely used and are mostly found with the tribal people of Central India. The *Garos* use clubs of a crude variety made of wood. The *Garo* club is about 3 feet long. Sometimes the club was also thrown. It has been noticed that warring tribes of the *Rengma Nagas* used clubs in the earlier days but now it has become obsolete. The clubs of the *Firians* are profusely decorated. Their average length is 3 feet The head is globular and fitted with spikes. Similar clubs used by the Mughals were known as *Gurj.* These clubs at present are mostly used by the leaders of the tribes on ceremonial occasions.

Battleaxe

This is also commonly used by the tribal people. The *Khasi* battleaxe is known as *Burha Khanda.* The handle is made of strong wooden sticks about 8″ in diameter. The crescent-shaped blade has a hollow socket which is inserted in the shaft The edge is very sharp. Sometimes two blades, one on either side, are attached to the same shaft. The *Kadaras* use short battleaxes while the blade of *Garo* battleaxe resembles the peak of a parrot. The *Khandas* of Madhya Pradesh use a peculiar battleaxe. The blade here consists of a central-spear-shaped point with sharp lateral edges. These are, however, not of much importance.

Tribal-Archery

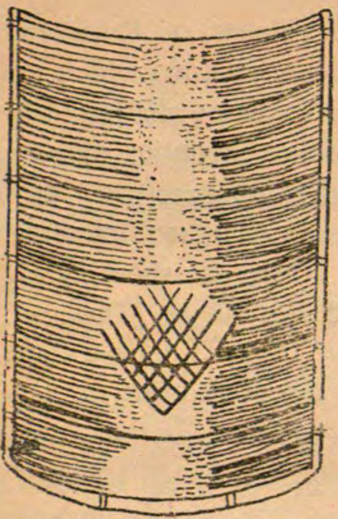
The bows and arrows used by the tribal people have perhaps not undergone any great material changes during these hundreds of years. The bows of the *Abor* (*Adi* of NEFA) are simple and are made of a single piece of bamboo. The central portion of the stave is broad and almost flat. The string is mounted on the stave only during use, so that the strength and elasticity of the stave are maintained. The total length of the stave is about 4 ft. 10″; the circumference at the broadest point is about 26 ft. six inches and the length of the horn is only three fourth of an inch. The *Lushei* bows are comparatively smaller in size and are made of bamboo. Bows among the *Tharoos* are almost obsolete and the one that still exists is about 5 feet long, has a simple bamboo stave and is provided with a fibre string. The *Parum Kukis* use a bow of bamboo; the length of the stave is about five feet and the string is made of a kind of a twisted grass. Arrows of the *Adis* of NEFA are generally of two kinds known as *Epug* (bamboo shaft and bamboo head) and *Yengmo* (bamboo shaft and iron head). Carrying cases for arrows are known as *Gabdung* among *Abors*. These arrowheads are smeared with poison which is commonly aconite and is collected from creepers like

Archer (after Sachin Roy)

Talo and *Mane.* The *Sherdukpens* living mainly in the two villages of Rupa and Shergaon, south of Kameng frontier division (NEFA), use poisonous arrows which are carried in quivers of bamboo tubes. Bows with trigger arrangements are also used by them. The *Akas* tribe of the same division and the *Gallongs* of Siang frontier division (NEFA) use bows and arrows known by the names of *Tkeri* and *Moo* respectively. They are made in small and large sizes by the people themselves for their requirements. Arrows are of two types i. e. arrows for shooting birds and arrows for shooting big games. The bow are hung over the shoulder and arrows carried in a quiver (*Thouveu*). In addition to hunting with bows and arrows the *Idu Mishmis* of NEFA have some ingenious ways of snaring and trapping animals and birds—the device is more or less based on the same mechanism.

The *Grasias* of Bombay and Rajasthan prepare bows of split bamboo. The string is also a strip of bamboo at the end of which buffalo or bullock gut string is glued and tied fast and the string then tied to one end of the bow. The arrow is prepared of a reed. The arrow head varies in length from $2\frac{1}{4}$ inches to $2\frac{3}{4}$ inches. At one end the iron blade is fixed and on the other side two thick stripes of wood and four pieces of feather in a cross section are tied with thin string and glued together. The *Grasias* use bow and arrows well, and aim fairly accurately from a distance of 50 to 100 feet. Several hunting scenes of tribal people are also available in the folk arts. In one *Juang* carving on the inner door of the boy's dormitory at Balipal 'Orissa'. the bowman is trying to shoot an arrow. A part of a door for the *Konds* by a *Pano*,carpenter of Ganyam district, Orissa, depicts a long arrow attached to the bow string. *Santhals* use a bow, three cubits in length, for shooting fowls. The arrows are made of *Dulchar* (reed) on which a point of bamboo is stuck. On the top is fitted a feather of fowl in an angular slant to regulate the movement. When hunting animals they use arrows with triangular heads of iron.

Orra is the name given to bow and *Abro* to arrow by the *Malers*, a hill tribe in Bihar. The *Mumars* of Raipur district of Madhya Pradesh have reputation of being expert hunters. They carry with them bows and arrows whenever they go out in the jungle. Their boys get regular training in archery from early childhood in shooting small birds, hares, squirrels, etc., with small wooden arrows. The *Kumars* even kill rats with arrows to supplement their food. They do not take interest in shooting



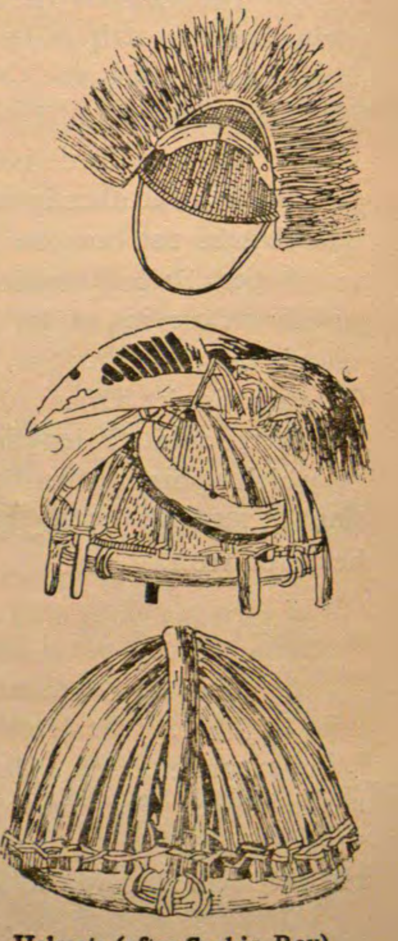
Shield (after Sachin Roy)

birds but may occassionally hit a peacock. Two types of arrows known as *Dophias* and *Chobhas* are used in fishing as well.

The *Bhils* of Rajasthan and Khandesh are experts in the use of arrows ; the very name *Bhil* is said to mean a "bowman." In 1600 A.D., in a local fight between the Suba of Baroda and the King of Rajpipla, it is said in a Bhil folk song,

> "The Bhills flung their arrows far and wide,
> they were so brave that even dead they shot
> their arrows".

The bow is made of bamboo (*Tuu*). The string (*Hite*) is either of bamboo string tied with threads (*Nands*) or a strong rope. The grove in which it is fixed in bamboo is called the *Korpi*. The pointed part of the arrow *Binkhi* is of a steel and is very neatly tied to a bamboo stick. On the other end feathers are tied and glued to guide the arrow's flight correctly. The bamboo shaft having a round steel head is called *Dosnu* which strikes birds without breaking their skin.



Helmets (after Sachin Roy)

Shields

The *Adi* shields are made of bamboo with interlaced cane stripes. These are rectangular in shape, concave inside and convex on the outerside. There is a horizontal handle, made of cane, fixed to the inner side. Rare specimens of shields, covered with *Mithun* hide, are found in the higher regions. These are slung over the shoulder with the help of a belt. These are very light but still no arrow, however strong it may be, can penetrate it. Often these shields are profusely decorated. Round shields were also known. The *Tharoos* use round shields of leather.

Armour

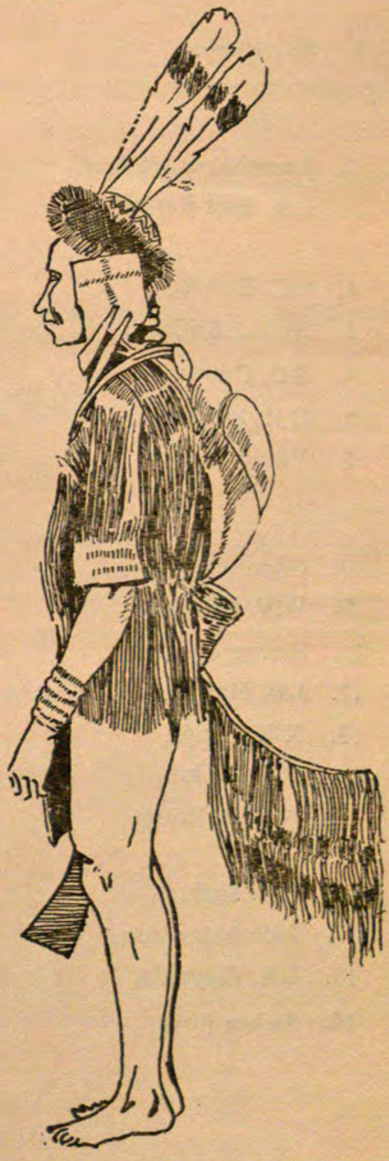
The use of helmet is very common. All the tribal chiefs invariably use them as a sign of prestige. War helmets are found in different shapes and have no projection These are made of cane with stripes all over it. The helmets used in the Cis-Humalayan regions are profusely decorated with dyed hair. Two boar tusks on the front are placed cross-wise and the bear skin is fixed on the top. Sometimes, beaks of birds are also attached to these helmets.

The Body-armour consist of heavy cotton shirt with sleeves and open neck. It is again decorated with buttons, beads and hair.

Panjis and Stone Chutes

Panjis are bamboo spikes made from pieces of bamboo sharpened like spikes and hardened in the fire. The points of *Panjis* are smeared with poison. These are stuck firmly into the ground and are concealed under the bushes, usually on the paths leading to the villages thus making the way impassable for the enemy. Similarly, stone chutes are placed on the hill side. These consist of strong bamboo poles arranged horizontally to serve as a platform over which are piled a large number of boulders, when released by cutting the bamboo lines with a *Dao*, the whole mass of heavy boulders roll down the hill-side, crushing whatever comes in the way. Thus all the possible approaches to the village are protected with stone chutes.

Most of the weapons mentioned adove are manufactured locally but sometimes these are imported from Nepal, Burma and Tibet. Some of these tribes like the *Nagas* have started using guns also .Thus on the one hand they retain their ancient tribal character and on the other they are keeping pace with the times. It is the right time that a student of military science should start making a thorough study of these weapons before they become obsolete.



A Naga Chief (after Elwin)

For Further Study

1. A. Aiyappan,	*Social and Physical Anthropology of the Navadis* and *Report on the Socio-economic conditions of the aboriginal tribes of the province of Madras.*
2. Ananthakrishna Iyer,	*The Mysore Tribes and Castes*, 4 vols.
3. L.K. Bala Ratnam,	*Anthropology through the ages-Broadway Times* Madras (1959), Vol. I, Nos. 3 and 4.
4. P.C. Biswas,	*Santhals of the Santhal paraganas.*
5. Robert Briffault,	*The Mothers.*
6. S.C. Dubey,	*The Kamar.*
7. U.R. Ehrenfels,	*Kadar of Cochin.*
8. Verrier Elwin,	*The Aboriginal*; *The Barga*; *Tribal Myths of Orrissa*; *Bondo Highlander* and *A Philosophy of NEFA.*
9. Gopal Panikkar,	*Malabar and its Folk.*
10. W.V. Grigson,	*The Maria Gonds of Bastar.*
11. Haimendorf,	*The Reddis of the Bison Hills.*
12. J.H. Hutton,	*Angami Nagas and The Semi Nagas.*
13. K.K. Leuva,	*The Asur.*
14. T.V. Naik,	*The Bhils, a study*
15. W.H.R. Rivers,	*The Todas*; *The Birhos*; *The Kharias* and *The Mundas and their country.*
16. P.G. Shah,	*The Dublas of Gujarat.*
17. Sachchidananda,	*Cultural change in Tribal Bihar.*
18. L.P. Vidyarthi,	*The Maler.*
19. Sachin Roy,	*Aspects of Padam Minyong Culture* (Shillong, NEFA, 1960.

ABBREVIATIONS

A.D.	Anno Domini.
A.H.	Hijra era.
A.S.B.	Asiatic Society of Bengal.
B.M.C.	Catalogue of the British Museum.
C.C A.I.	Catalogue of the Coins of Ancient India.
C.C.P.M.	Catalogue of Coins in the Punjab Museum, Lahore, Vol. I, II.
I.A.	Indian Antiquary.
I.M.C.	Catalogue of the Coins in the Indian Museum, Calcutta.
J.A S.B.	Journal of the Royal Asiatic Society of Bengal.
J R.A.S.	Journal of the Royal Asiatic Society.
L.M.C.	Catalogue of the Lahore Museum.
Num. Chron.	Numismatic Chronicle and Journal of the Royal Numismatic Society.
Pl.	Plate.
Var.	Variant.

ARMS COLLECTIONS

1. Anthropology Department, University of Lucknow, Lucknow.
2. Anthropology Museum, University of Delhi, Delhi.
3. Archaeological Museum, Bijapur.
4. Archaeological Museum, Kondapur.
5. Archaeological Museum and Picture Gallery, Trichur.
6. Archaeological Museum, Red Fort, Delhi.
7. Archaeological Museum, University of Saugar, Saugar.
8. Baripada Museum, Orissa.
9. Baroda Museum and Picture Gallery, Baroda.
10. Bharat Kala Bhawan Museum of Art and Archaeology, Banaras Hindu University, Banaras.
11. Bhartiya Itihasa Samshodhan Mandal Museum, Poona.
12. Bhuri Singh Museum, Chamba, Himachal Pradesh.
13. Central Museum, Nagpur.
14. Central Museum, Indore.
15. Central Sikh Museum, Amritasara.
16. Chandradhari Museum, Darbhanga.
17. Dogra Art Gallery, Jammu.
18. Durbar Hall, Silehkhana, Junagadh.
19. Fort Saint George Museum, Madras.
20. Ganga Golden Jubilee Museum, Bikaner.
21. Government Museum, Alwar.
22. Government Museum, Gaya.
23. Government Central Museum, Jaipur.
24. Government Museum and National Art Gallery, Madras.
25. Government Museum, Simla.
26. Gurukula Museum, Gurukul Kangadi, Haradwar.
27. Indian Museum, Calcutta.
28. I.V.K. Rajwade Sansodhan Mandal Museum, Dhulia.
29. Indian War Memorial Museum, Red Fort, Delhi.
30. Jamanagar Museum of Antiquities, Jamanagar.
31. Junagadh Maseum, Junagadh.
32. Kolhapur Museum, Kolhapur.
33. Kutch Museum, Bhuj.
34. Lady Wilson Museum, Dharampur.
35. Mahant Ghasidas Memorial Museum, Raipur.
36. Museum of the Deccan College Post Graduate Research Institute, Poona.

37. Museum of Antiquities, Padmanabhapuram.
38. Museum and Saraswati Bhandar, Kotah.
39. Mysore Government Museum, Bangalore, Mysore.
40. Nalanda Museum, Nalanda.
41. National Museum, New Delhi.
42. Natural History Museum of Saint Joseph's College, Tiruchirapalli.
43. Orissa State Museum, Bhubaneswar.
44. Patna Museum, Patna.
45. Prince of Wales Museum, Bombay.
46. Provincial Museum, Patiala.
47. Rajputana Museum, Ajmer.
48. Salar Jung Museum, Hyderabad.
49. Sardar Vallabhbhai Patel Museum, Surat.
50. Sardar Museum, Jodhpur.
51. Sikar Museum, Sikar.
52. S.P.S. Government Museum, Srinagar.
53. Sriranganathswami, etc., Devasthanams Museum, Srirangam.
54. State Museum, Bharatpur.
55. State Museum, Dhubela Place, Nowgong.
56. State Museum, Jamna Bagh, Gwalior.
57. State Museum, Lucknow.
58. State Museum, Hyderabad.
59. Sir Choturam Museum, Sangaria.
60. Sri Venkateswara Museum, Tirupati.
61. Tribal Research Institute, Chhindwara.
62. Victoria and Albert Museum, Bombay.
63. Victoria Hall Museum, Udaipur.
64. Victoria Memorial Hall Museum, Calcutta.
65. Watson Museum, Rajkot.

BIBLIOGRAPHY

Sanskrit, Pali and others translated works

Bode, M.H. and Geifer, *Mahabharata* (tr.).
Mahavamsa (tr.).

Cowell, E.P., *The Jatakas*, 6 Vols. translated under the editorship of Cowell, Cambridge University Press (1895-1913).

Cowell and Thomas, *Bana's Harshacharita* (tr.), Delhi, 1961.

Dutt, M.N., *Markandeya Puràna* (tr.), Varanasi, 1967.
Agni Purana (tr.).
Ramayana (tr.).

Dwivedi, S., *Brihatsamhita of Varah-mihar* (ed.), Banaras.

Griffith, R.T.H., *The Hymns of Rigveda*, 2 Vols., Banaras, 1896.
Ramayana.

Kale, M.R., *Vishakhadutta's Mudrarakshas* (ed.).
Dasha Kumarcharita, Bombay, 1925.

Kalidasa, *Abhigyana Shakuntalam* (ed.), Ramnath Jha, Darbhanga, 1957.
Ritusamhara (ed.), Narayan Ram Acharya, Bombay, 1952.
Malvikagnimitra (ed.), Narayan Ram Acharya, Bombay, 1950.
Meghaduta (ed.), Narayan Ram Acharya, Bombay, 1948.

Karmarkar, R.D., *Mrcchhakatika* (ed.), Poona, 1937.

Krishacharya, T.R. and Vyasacharya, T.R., *Ramayana* (ed.), Bombay, 1911.

Macdonell and Keith, *Vedic Index*, 2 Vols., 1912 (Reprint), Delhi, 1958.

Muir, John, *Original Sanskrit Texts*, 5 Vols., 1868-1874.

Oppert, G., *Nitiprakasha* (ed.).

Panchanana, *Matsya Purana* (ed.).

Roy, P.C., *Mahabharata* (tr.).

Sarkar, B.K., *Sukracharya Nitishastra* (tr.).

Shastri, G., *Asvalayana Grhya Sutra* (ed.).

Shastri, H.P., *The Ramayana of Balmiki* (tr.), 3 Vols., London, 1958.

Sham Shastri, R , *Kautilya's Arthshastra* (ed.), Mysore, 1908.

Stein, Aurel, *Kalhana's Rajatarangini* (tr.), 2 Vols., Delhi, 1960-61.

Tawney, *Kathasaritsagara of Somadeva* (tr.)
edited Penzer, vols., 1 to 10, London, 1924-28.

Whiteny, W.D., *Atharva Veda Samhita*, Cambridge, 1905.

Arms and Warfare

Baden, Powell, *Handbook of Manufacturers ànd Arts of the Panjab*, Vols. II.

Bajwa, F.S., *Military System of the Sikhs*, 1964.

Blacker, *The British Army in India* (1817-19).

Chakravarti, P.C., *The Art of War in Ancient India*, Dacca, 1941.

Charls, *The War in India*, London, 1876.

Clausewitz, *On War*, 3 Vols., 1949.
Principles of War, 1952.

Date, G.T., *The Art of War in Ancient India*, Bombay, 1929.

David, Altaf, *Indian Art of War*, 1953.

Dikshitar, V.R.R., *War in Ancient Period*, London, 1944.

Downing, *A Comprehensive History of the Indian Wars.*

Egerton of Tatton, *Indian and Oriental Armour.*
An Illustrated Handbook of Indian Arms, 1880.

Irvine, W., *The Army of the Indian Moghuls*, 1903.

Majumdar, B.N., *A Study of Indian Military History*, New Delhi, 1963.
Military Systems of the Sikhs, New Delhi, 1965.

Maliwal, B.N., *Elementary Military Science* (Hindi), Meerut, 1964-65.

Montross, L, *War Through the Ages*, New York, 1960.

Ney, Marshall, *Military Studies*, 1833.

Oakeshott, R.E., *Archaeology of Weapons, Arms and Armour from Pre-history to the Chivalry*, London 1960.
The Sword in the Age of Chivalry, London, 1964.

Oppert, Gustav, *On the Weapons, Army Organisation and Political maxims of the Ancient Hindus*, Ahmedabad, 1967.

Orme, Robert, *History of the Military Transactions of the British Nation in Hindostan*; 3 Vols. Madras, 1861-62.

Pant, G.N., *Bharat Ke Prachin Shastrastra Aur Yuddhakala* (Hindi), New Delhi, 1964.

Palit, D.K., *Essentials of Military Knowledge*, 1950.

Peterson, H.L., *Book of the Gun*, London, 1962.

Picq, Ardant Du, *Battle Studies—Ancient and Modern Battle*, tr. J.N. Greely and R.C. Cotton, New York, 1921.

Rajendra Singh, *History of the Indian Army*, Delhi, 1963.

Robinson, J.W., *Arts of the Japanese Sword*, London, 1961.

Ray, H.C., *Notes on War* (Journal of the Department of letters, Vol. XIV, 1927).

Sarkar, Jadunath, *Military History of India*, Calcutta, 1960.

Sen, S.N., *The Military System of the Marathas*, New Delhi, 1958.

Singh, S.D., *Ancient Indian Weapons with special reference to the Vedic Period*, Leiden, 1965.

Sivaramamurti, C., *Royal Conquests and Cultural Migrations in South India and the Deccan*, Calcutta, 1955.

Snodgrass, A., *Early Greek Armour and Weapons*, Edinburg, 1964.

Tandon, R.K. and Sahni, P.R., *History of Indian Military Systems* (Hindi), Bareilly, 1964.

Thakur, K.K., *Bharat Ki Prasiddha Ladaiyan* (Hindi), Allahabad, 1965.

Thornborn, *The Punjab in Peace and War*, London, 1904.

Wales, H.G.Q., *Ancient South-East Asian Warfare*, London, 1952.

Art, Archaeology, Anthropology and General

Allan, J., *Indian Coins Acquired by the British Museum*, London, 1935.

Allachin, B. and Allachin, R., *The Birth of Indian Civilization*, Middlesex, 1968.

Altekar, A.S., *Coinage of the Gupta Empire and its Imitations*, Vol. IV, Banaras, 1957.
Rashtrakutas and their Times, Poona, 1934.

Altekar, A.S. and Majumdar, R.C., *Vakataka-Gupta Age*, Banaras, 1954.

Annigeri, A.M., *A Guide to the Pattadakel Temples*, Dharwar, 1961.

Apte, M.C., *Agnipuranam*, Poona, 1957.

Apte, V.M., *Social and Religious Life in the Grihya Sutras*, Bombay, 1954.

Arberry, A.J., *Aspects of Islamic Civilization as Depicted in the Original Texts*, London, 1964.
Humayunnama, (ed.) London, 1963.

Archer, W.G., *Paintings of the Sikhs*, London, 1966.
Garhwal Paintings, London, 1954.
Indian Miniatures, Greenwich, 1960.
Kangra Paintings, London, 1952.

Arrowsmith, R., *Rigveda* (tr.), Boston, 1898.

Arshi, I.A., *Catalogue of the Arabic Manuscripts In Raza Library*, Rampur, Vol. I, 1963, Vol. II, 1968.

Abul Fazl-i-Mubarak-i-Allami, *Akbarnamah*, (ed.). 3 Vols, Calcutta, 1877-86.
Ain-i-Akbari, translated by H. Blochmann edited by S.L. Goomer, Delhi, 1965.

Abdul Halim, *History of the Lodi Sultans of Delhi and Agra*, Dacca. 1961.

Abraham, T.M., *Handicrafts in India*, New Delhi, 1964.

Acharya, P.K., *Glories of India* and *Indian Culture and Civilization*, Allahabad, 1952.
Mansara (ed.), Vols. 3,5,6, London, 1933.

Agrawala, V.S., *Harshacharita Ek Sanskritika Adhyayan* (Hindi), Patna, 1953.
The Heritage of Indian Art, New Delhi, 1962.
India as Known to Panini, Banaras, 1963.
Markandeya-Purana (Hindi), Allahabad, 1961.
Rigveda, Vol. I, Varanasi, 1963.
Vaman Purana-a study, Varanasi, 1963.

Agnihotri, P., *Patanjali Kalin Bharat* (Hindi), Patna, 1963.

Ahmud, Syud, *Toozuk-i-Jehangeeree*, Aligarh, 1864.

Aiyar, K.A., *Minor Upanishadas* (tr.), first series, Madras, 1967.

Ali Mohammad Khan, *Mirat-i-Ahmadi* (tr.), Baroda, 1965.

Ali, S.M., *The Geography of the Puranas*, New Delhi, 1966.

Allam, J. and others, *Cambridge Shorter History of India*, Delhi, 1969.

Arya Sura, *Jatakamala* (ed.), Darbhanga, 1959.

A.A. Rizvi, *Aadi Turk Kalin Bharat* (Hindi), Aligarh, 1956.
Khilji Kalin Bharat (Hindi), Aligarh, 1955.
Mughal Kalin Bharat (Hindi), Aligarh, 1960.

Atkinson, J., *Firdausi's Shahnama* (ed.), London, 1886.

Awasthi, A.B.L., *Studies in Skanda Purana*, Part I, Lucknow, 1965.

Bachhofer, L., *Early Indian Sculptures*, Paris, 1929.

Bajpai, K.D., *Ahichchchatra*, Lucknow, 1950.
Hastinapur, Lucknow, 1956.

Bamm Peter, *Alexander the Great*, London, 1968.

Banerjea, A.C., *Studies in the Brahmanas*, Delhi, 1963.
Lectures in Rajput History, Calcutta, 1962.

Banerjee, Indubhushan, *Evolution of the Khalsa*, Vols. 2, Calcutta, 1947.

Banerjea, J.N., *Development of Hindu Iconography*, Calcutta, 1956.

Banerjee, N.R., *The Iron Age in India*, Delhi, 1965.

Banerjee, R.D., *Age of the Imperial Guptas*, Banaras, 1933.

Banerji, S.C., *Dharm-Sutras*, Calcutta, 1962.
Kalidasa-Kosha, Varanasi, 1968.

Barrett, Douglas, *Early Chola Bronzes*, Bombay, 1965.
Sculptures from Amaravati in the British Museum, London, 1954.

Barua, B., *Bharhut*, Calcutta, 1934.

Basam, A.L., *Studies in Indian History and Culture*, Calcutta, 1964.

Beihoff, N.J., *Ivory Sculptures through the Ages*, Milwavkee, 1961.

Beveridge, Henery, *The Tuzuk-i-Jahangiri* (ed.), tr. by Alexander Rogers, Delhi, 1968.

Bhandarkar, D.R., *Asoka*, 3rd ed., Calcutta, 1955.

Bhattacharya, A.K., *Chamba Rumal*, Calcutta, 1968.

Bhattacharya, B., *Indian Buddhist Iconography*, London, 1924.

Bhattacharya, B.C., *Jaina Iconography*, Lahore, 1939.

Brown, C.J., *Catalogue of the Coins of the Gupta.........*, Allahabad, 1920.

Brown, Percy, *Indian Paintings*, 7th ed., Calcutta, 1922.

Brown, W.N., *Catalogue of Jaina Kalpasutra*, Washington, 1934.

Buddha Prakash, *Glimpses of Ancient Punjab*, Patiala, 1966.

Burgess, James, *The Cave Temples of India*, Delhi, 1969.

Chand Bardai, *Prithiviraj Raso*, edited by M.V. Pandia and others, Banaras, 1905-29.

Chatterjee, K.C., *Patanjali's Mahabhasya* (tr.), Calcutta, 1957.

Chatterjee, S.C., *Magadha Architecture and Culture*, Calcutta, 1942.

Chattopadhya, B., *The Age of the Kushanas—a Numismatic Study*, Calcutta, 1967.

Chattopadhyaya, S., *Sakas in India*, Vishvabharati, 1955.

Chaturvedi, S.R,, *Kalidasa Granthavali* (ed. Hindi), Kashi, 1954.

Coomaraswamy, A.K., *History of Indian and Indonesian Art* (Rajput Paintings), London, 1916.

Cunningham, A., *Coins of Ancient India............*, Varanasi, 1963.

Cunningham, A., *Stupa of Bharhut*, Varanasi, 1952.

Cunningham, J.D., *History of the Sikhs*, Delhi, 1955.

Dandekar, R.N., *Vedic Bibliography*, Vols. 2, Poona, 1961.

Das, A.C., *Rigvedic India*, 2nd. ed., Calcutta, 1927.

Dave, P.C., *Grasias*, Delhi, 1960.

Deshraj Thakur, *Sikh Itihasa* (Hindi), Sangariya, 1954.

Desikachari, T., *South Indian Coins*, Trichinopoly, 1933.

Devadhar, C.R., *Dramas of Kalidasa*, Delhi, 1966.

Dickinson, E. and Karl Khandalwala, *Kishangarh Paintings*, New Delhi, 1959.

Dikshitar, V.R.R., *Gupta Polity*, Madras, 1952.

Divanji, P.C., *The Valmiki Ramayana* (ed.), Baroda, 1952.

Dowson, J. and Elliot, H.M., *History of India as told by its own Historians*, Calcutta, Vols. 1-VIII, 1953-1956.

Dube, S.C., *Kamar*, Lucknow, 1951.

Duff, Grant, *History of Marathas*, tr. by Kamlakar Tiwari, Allahabad, 1965.

Edwards, S.M., *Babur—Dramatist and Despot*, London.

Fergusson, J. and Burgess, J., *The Cave Temples of India*, Delhi, 1969.

Fraser, James, *History of Nadir Shah*, London, 1742.

Gaekwad's Oriental Series, *Mirat-i- Ahmadi*, tr. by M.F. Lokhandwala, Baroda, 1965.

Gairola, Vachaspati, *Arthasastra of Kautilya*, Varanasi, 1962.

Ganda Singh, *The Punjab* (1839-40), Amritsara, 1952.

Gangoly, O C., *Masterpieces of Rajput Painting*, Calcutta, 1926.

Gopal Singh, *Guru Govind Singh*, New Delhi, 1966.

Gordon, D.H , *Pre-historic background of Indian Culture*, Bombay, 1958.

Gray, Basil, *Rajput Painting*, 1947.

Gupta, Jagdish, *Pragaitihasik Bhartiya Chitrakala* (Hindi), Delhi, 1967.

Gupta, P.L., *The Amaravati Hoard of Silver Punch-marked Coins*, Hyderabad, 1963.

Gyani, S.D., *Agni-purana ; a study*, Varanasi, 1964.

Hazara, R.C., *Studies in Upapuranas*, Calcutta, 1962.

Herringham, Lady, *Ajanta Frescoes*, London, 1915.

Husain, M.A., *Agra Fort*, New Delhi, 1956.

Jain, J.C., *Life in Ancient India as depicted in the Jaina Canons*, Bombay, 1947.

Johar, S.S., *Guru Gobind Singh—a biography*, Delhi, 1967.

Kala, S.C., *Terracotta Figurines from Kaushambi*........ ,Allahabad, 1950.

Kane, P.V., *History of Dharmasastra*, 6 Vols, Poona, 1930-58.

Kantawala, S.G., *Cultural History from the Matsya-purana*, Baroda, 1964.

Karmarkar, R.D., *Bana*, Karnatak University, 1955.
Kalidasa, Karnatak University, 1960.

Kaul, G.L., *Kashmir through the ages* (5000 B.C. to 1960 A.D.), Srinagar, 1960.

Kangle, R.P., *Arthsastra—a critical edition with a Glossary*, Part I-III, Bombay, 1960.

Khandalwala, Karl, *Indian Sculptures and Paintings*, Bombay, n.d.
Kishangarh Painting, Lalit Kala Akademi, New Delhi.
Pahari Miniature Paintings, Bombay, 1958.

Khushwant Singh, *Ranjit Singh, Maharaja of the Punjab*, London, 1962.

Kiramani, H.A.K., *History of Tipu Sultan*, 2nd ed., Calcutta, 1958.

Knizkova, H. and March, J., *The Jengliz Khan Miniatures from the Court of Akbar the Great* tr. by Olga Kuthanova, London, 1963.

Konow, Sten, *Kharoshthi Inscriptions*, Calcutta, 1929.

Kramrish, Stella, *Indian Sculptures*, Calcutta, 1933.

Krom. N.J., *Barabudur, Archaeological Description*, Hague, 1927.

Kuhnel, Ernst and Goetz, H., *Indian Book Paintings*, London, 1929.

Lal, K.S., *History of the Khaljis* (1290-1320), Allahabad, 1950.

Lamb, Harold, *Babur the Tiger, first of the Great Moguls*, London, 1962.

Lane Poole, Stanley, *Aurangzeb and the Decay of Mughal Empire*, Oxford, 1896.

Law, B.B., *India as described in Early Texts of Buddhism and Jainism*, London, 1941.

Lokhandwala, M.F., *Mirat-i-Ahmadi ; a Persian History of Gujrat*, *tr.* by Ali Muhammad Khan, Baroda, 1965.

Macdonell, A.A. and Keith, A.B., *Vedic Index of Names and Subjects*, Varanasi, 1958.

Mackay. E., *Early Indus Civilization*, 2nd ed., London, 1948.
Further Excavations at Mohenjo-Daro (1927-1931), 2 Vols., Delhi, 1938.

Majumdar, D. and Gopal, *Pragitihasa* (Hindi), Bombay, 1964.

Majumdar, R.C., *Ancient India*, Banaras, 1952.
History and Cultures of the Indian people, Bhartiya Vidya Bhawan Series, Vols. 1-10.

Mate, M.S., *Maratha Architecture* (1650-1850), Poona, 1959.

Mathur, N.L., *Red Fort and Mughal Life*, New Delhi, 1969.

Mohan, M.V.D., *The Indo-Greek Coins*, Ludhiana, 1967.

Mookerji, R.K., *Chandragupta Maurya and his times*, Delhi, 1952.
Harsha, London, 1926.
Indian Shipping............, London, 1912.

Moti Chandra, *Jain Miniature Paintings from Western India*, Ahmedabad, 1919.
Prachin Bhartiya Veshbhusha (Hindi), Allahabad, V.S. 2007.

Munshi, K.M., *Saga of Indian Sculpture*, Bombay, 1957.

Naik, T.B., *Bhils, a study*, Delhi, 1956.

Nesturkh, M., *Origin of Man* tr. George M. Hann, Moscow, 1959.

Piggot, S., *Some Ancient Cities of India*, London, 1945.

Prasad, Ishwari, *Life and Times of Humayun*, Bombay, 1955.

Puri, B.N., *Cities in Ancient India*, Delhi, 1966.
History of the Gurjara-Pratiharas, Bombay, 1957.
India in the times of Patanjali, Bombay, 1957.
India under the Kushanas, Bombay, 1965.

Psualkar, A.D., *Studies in the Epics and Puranas*, Bombay, 1965.

Qanungo, K.R., *Studies in Rajput History*, Delhi, 1960.
Sher Shah and his times, Bombay, 1965.

Qureshi, I.H., *The Administration of the Sultanate of Delhi.*

Raghu Vira (ed.), *Ramayana of Valmiki*, Lahore, 1938.

Ragozin, Z.A., *Vedic India*, Delhi, 1961.

Rapson, E J., *Catalogue of the Coins of the Andhra Dynasty.........*, London, 1908.

Roy, Sachin, *Aspects of Padam Minyong Culture*, NEFA, 1960.

Sabnis, S.A., *Kalidasa—his Style and his Times*, Bombay, 1966.

Saletore, R N., *Life in the Gupta age*, Bombay, 1943.

Sankalia, H.D , *Archaeology of Gujrat*, Bombay, 1964.
Stone Age tools........., Poona, 1964.

Sardesai, G.S., *New History of the Marathas*, Vols. 2, Bombay, 1956.

Sarkar, Jadunath, *House of Shivaji*, 3rd. ed., Calcutta, 1955.
Mughal Administration, 4th ed., Calcutta, 1952.

Sastri, K.A N., *Age of the Nandas and Mauryas*, Banaras, 1952.

Sastri, K.N., *New Light on the Indus Civilization*, Delhi, 1965.

Schoff, W.H., *Periplus of the Erythracan Sea, Travel and Trade in the Indian Ocean*, tr. from Greeks, London, 1912.

Seely, J.B., *Wonders of Ellora*, London, 1825.

Sen, A., *Rajagriha and Nalanda*, Calcutta, 1954.

Sethi, R.R., *Mighty and Shrewd Maharaja*, Delhi, 1960.

Shah, U.P , *Studies in Jaina Art*, Banaras, 1955.

Shamasastry, R., *Kautilya's Arthasastra* (tr.), Mysore, 1951.

Sharma, B.N., *Social Conditions of Northern India*, C. 1000-1200 A.D. (under print).

Sharma, Dasharatha, *Early Chawhan Dynasties*, Delhi, 1959.
Rajasthan through the Ages, Vol. I., Ajmer, 1966.

Sharma, G.R., *Excavations at Kausambi* (1957-59), Allahabad, 1960.

Sharma, R.K., *Alberuni's India* (tr.), Allahabad, 1967.

Shastri, Ramtej, *Kalhana's Rajatarangini* (ed.), Kashi, 1960.

Shejwalkar, T.S., *Panipat* : 1761, Poona, 1946.

Shenfield, M., *Prehistoric Cave Painting* (tr.), London, 1962.

Shukla, B.K., *Dafias of the Subansiri region*, NEFA, 1959.

Singh, Ganda, *Ahmad Shah Durrani*, London, 1959.

Sinha, H.N., *Rise of Peshwas*, Allahabad, 1954.

Sinha, N.K., *Ranjit Singh*, Calcutta, 1951.

Sirkar, D.C., *Select Inscriptions*, Vol. I, Calcutta, 1965.

Sivaramamurti, C., *Epigraphical Echoes of Kalidasa*, Madras, 1944.
Indian Bronzes, Bombay, 1962.
Early Eastern Chalukya Sculptures, Madras, 1957.
Indian Sculptures, Bombay, 1961.
Amaravati Sculptures in the Madras Govt. Museum, Madras, 1956.
Mahabalipuram, Delhi, 1952.
South Indian Bronzes, Lalit Kala Akademy, New Delhi, 1963.

South Indian Painting, National Museum, New Delhi, 1969.
Some Aspects of Indian Culture, National Museum, New Delhi, 1970.

Smith, V.A., *Akbar, the Great Mogul*, Oxford, 1917.

Srivastava, A.L., *Sultanate of Delhi*, Agra, 1953.

Stein, Aurel, *Descriptive Catalogue of Antiquities*………,Delhi, 1935.
Innermost Asia, Oxford, 1928.
Kalhana's Rajatarangini, Delhi, 1961.

Suri, Sohan Lal, *Umdat-ut-Tawarikh*, Delhi, 1961.

Tara Chand, *Society and State in Mughal Period*, Delhi, 1961.

Taylor, S.W., *Daily Life in Ancient India*, Bombay, 1965.

Trilochan Singh, *Guru Teg Bahadur*, Delhi, 1967.

Upadhyaya, B S., *India in Kalidas*, Delhi, 1968.

Vidya Prakash, *Khajuraho*, Bombay, 1967.

Welch, S.C., *The Art of Mughal India*, New York, 1964.

Yajdani, G. *Ajanta*, 3 Vols., 1930-55.

Zeuner, F.E., *Prehistory in India*, Poona, 1951.

Zimmer, H., *Art of Indian Asia*, New York, 1955.

GLOSSARY

A

Ab—Temper.
Achal—A position of shooting arrow.
Adha-Sandhan—A position of shooting arrow.
Adham—Worst.
Agnidiptimukhani—Arrows splitting fire.
Agramandir—A type of ship.
Aiti—Spear.
Akasajanani—A type of fort.
Alemani or *Almani*—A type of sword.
Alidha—An archery-pose.
Amukta—A type of weapon.
Andhiari—Horse armour.
Angrakha—Coat of mail.
Ankaridar—An arrow.
Ankush—Elephant-goad.
Arabi—A type of hilt.
Aradam—A variety of sword.
Aramukh—A variety of sword.
Arapusta—A variety of sword.
Arayasha—A boat.
Ardhachandra—Crescent-headed arrow.
Arka—Material for bow-string.
Asayasha—A boat.
Ashuga—An arrow.
Ashvamedha—Horse-sacrifice.
Asyasthi—A type of sword.
Atekari—A spear.
Atta—Ramparts.
Attalaka—Towers for watchmen.
Ayadakatti—South Indian dagger.
Ayudha Purusha—Personified Weapons.

B

Baghnakh—Tiger claw.
Bairagi Crutch—A weapon.
Bakhtar—Body armour.
Balas—Tribal sling.
Bala Tung—Ornamental tassels.
Ballam—Javelin.
Bana—Arrow.
Banduk—Gun.
Baneh—A weapon.
Bank—A weapon.
Barachha—A variety of spear.
Bara Jamadadu—A long knife.
Barudkhana—Gun-powder house.
Balasa—Pommel of the sword-hilt.
Batsdanta—Arrow-head like the teeth of a calf.
Bhala—Spear.
Bhanju—Armour.
Bharmar—A gun.
Bhelhetah—A type of sword.
Bheri—Trumpet.
Bhid-Chir—A Maratha dagger.
Bhindipala—A mythical weapon.
Bichhawa—A dagger.
Binkhi—An arrow.
Budgaro—A ship.
Bulat—Steel.
Burha Khanda—A dagger.

C

Chahar-aina—Cuirass.
Chakkar Sada—Plain quoits.
Chala—Aim of archery.
Chalachala—Aim of archery.
Chakmaqi—Flint-lock.
Chakmagh—A battleaxe fastened to the saddle.
Chap—A wood for bow-stave.
Chaqu—Knife.
Charak—Cross-bow.
Chaturangini—Four divisions of army.
Chaturmukha—Four faced.
Chhura—Big knife.

Chobha—An arrow.
Chowk—A part of the hilt.
Chuga—A Rajput weapon.

D

Dadurkram—A pose of shooting arrow.
Daivata—Divine fort.
Dandasana—A pose of shooting arrow.
Dandayat—A position of arrow.
Dao—Naga sword.
Daru—A type of sword.
Dastanah—Hand-armour.
Dauraricks—Trumpet.
Delhi Shahi—Hilt.
Derah—Camp.
Dhanush—Bow.
Dhanva Durga—Fort for the preservation of foodgrains.
Dhara—A Rajput weapon.
Dhas—A Burmese weapon.
Dhup—Straight sword.
Dhola—An arrow.
Dohra Gurj—Double-headed club.
Du-muhanah—Bifurcated arrow-head.
Dophia—An arrow.
Dora—A sword.
Dulchar—Reed.
Dumala—Tang.
Dumchi—Crupper.
Durasad—A name of sword.
Durbar—Court.
Durust andaz—A Gun having accurate aim.
Dushmankush—Enemy-killer.
Dvaichal—Aim.
Dvibhalla—Two pronged arrow-head.

E

Ekamukha—Fort having only one gate.
Epug—Arrow with bamboo shaft and bamboo head.

F

Fank—A Sikh sword.
Farasa—Battleaxe.
Farmayasa—A boat.
Fateh-jung—A variety of sword.
Fateh-laskar—A type of Mughal sword.
Fatila—Slow light match.

G

Gada—Club.
Gadbung—Quiver.
Gaddara—Sword.
Gajghao—A Rajput weapon.
Gajnal—Elephant-gun.
Gandiva—Bow of Arjuna.
Ganga-Jamuni—A design in damascening.
Gardani—Horse-armour.
Garguj—A variety of club.
Garj or Gurj—Spiked club.
Garo—Battleaxe.
Garudakrama—A pose of archery.
Gataka—A Rajput weapon.
Gaudh—A variety of bow.
Ghera—An arrow.
Ghoshan—Corners.
Ghugwal—A type of weapon.
Giri Durga—Mountain fort.
Gobhan—Pellet bow.
Gomati—Kine fort.
Gopuchha—A type of arrow.
Gubarah—Mortar.
Gulula-i-tufang—Arrow of the cross-bow.
Gunjayasha—A boat.
Gupti—Concealed weapon.

H

Habath—Howitzer.
Hakimkhani—A variety of hilt.
Halabbi—Blade.
Hat-dhonda—Stone.
Hathnal—Elephant-gun.
Hatta—A variety of sword.

I

Inam—Reign.
Irani-popat—Hilt.
Ishukara—Bow-maker.

J

Jafar Takiya—Maratha dagger.
Jaibah—Armour.
Jamdagnya—A mythical weapon.
Jamadhar—A Mughal dagger.
Jambiah or Jambuwah—A Mughal dagger.
Janeo—A part of the hilt.
Jauhar—Watered steel.
Jazail or Jajair—An armour.
Jazarant—Coat of mail.
Jinsi—Horse battery.
Joshan—Armour.
Julfikar—A type of sword.

K

Kakar—Five 'Ks' prescribed for every Sikh.
Kakatunda—A position of holding the bow string.
Kamal—Armour.
Kaman—Bow stave.
Kamar-jeb—Waist dagger.
Kamarsal—An armour.
Kamathah—A weapon.
Kangan—Corden.
Kangkat—Armour.
Kantha Shobha—Armour.
Kanthi—A part of the hilt.
Karanta or Katta—A Rajput weapon.
Kard-Khanjar—Long dagger.
Karmuka—A bow.
Karna—Ears of the fort.
Karpana—An arrow.
Karnik—A variety of arrow.
Karwal—Sword.
Katar—Dagger.
Kati—A variety of sword.
Katori—Pommel.
Kodanda—Bow.
Koft—A design in demascening.
Khang—A variety of Sikh sword.
Khajana—A part of the hilt.
Khanjar—Dagger.
Khapwah—A Mughal dagger.
Kharak—A machine consisting of heavy beams.
Kharjurvedha—An archery game.
Khasi—Battleaxe.
Khsepani—Pellet bow.
Khod—Helmet.
Khogi—Saddle.
Khsurapra—An arrow.
Khsudra—A ship.
Khukari—A Nepali weapon.
Khulani Phansi—A variety of weapon.
Khusk-anjir—Machine throwing stone.
Kimkhab—Velvet.
Kohartarash—A type of arrow.
Kotal—A variety of Mughal sword.
Kothis—Armour.
Kritrimsa—Artificial fort.
Kukadidar—A type of hilt.
Kulang Guptidar—A Rajput weapon.
Kuman-i-Gurohah—A type of bow.
Kunta—Spear.
Kurma Durga—Tortoise fort.
Kurta Zira—Coat of mail or Shirt.

L

Lahariadar—A zig zag dagger.
Laguda—A weapon.
Lais—A variety of arrow.
Lungee—Loin cloth.

M

Madhyam—A ship.
Maha Kirkorn—A variety of spear.
Mahapura—Big town.
Mahasaryantra—A machine hurling stones.
Mahi-durga—Clay fort.
Mahonet's ladder—A design in damascening.
Malvidyadhana—An archery game.
Mandala—Position of shooting arrow.
Mandalagra—Name of sword.
Mang—Rib.
Manjaniq—A machine throwing stones.
Matsya-bheda—A game of archery.
Matsari—Position of holding the bow string.

Meeri and Peeri—Two sacred swords of Guru Hargovinda.
Mian—Scabbard.
Minakar—Enamel painter.
Misls—Sikh confederacy.
Misra-durga—Mixed forts.
Mithun—Hide.
Mohra—Armour to cover the face of the horse.
Moo—An arrow.
Mootha—Grip.
Moti Daudati—*A* design on the blade of the sword.
Mrd Durga—Clay fort.
Mudairat—A type of weapon.
Mudgar—A type of weapon.
Murva—A creeper.
Musala—Pestle.

N

Naft—An arrow.
Nagarayana—War elephant.
Nakhhas—A part of the hilt.
Nakhoda—Commander.
Nal—Barrel.
Nalika—Barrelled weapon.
Nand—Thread.
Naptha—An arrow.
Napunsaka—An arrow.
Narach—An iron arrow.
Nareh—A type of weapon.
Narasingh-mooth—A variety of dagger.
Navadadhyaksha—Admiral.
Navak or Nawak—Small arrow.
Navatakseni—Navy.
Neja—Javelin.
Nischala—Target.
Nistrimsa—Sword.
Nuktab—A type of arrow.

O

Oloaka - Ship.
Orra—A type of bow.

P

Padmasana—A pose of archery.
Paikan Kash—Arrow puller.
Pakar or Pakhara—Back armour.
Pamree—Maratha armour.
Panja—Back scratcher.
Paraj--A part of hilt.
Parasu—Battleaxe.
Pardal—Sword belt.
Parikha—Moat.
Parjayanka—A mythical weapon.
Parvata—Mountain fort.
Paryupasana - Siege.
Pasa—Noose.
Patella—Ship.
Patrin—Arrow.
Patta—Long Maratha sword.
Peshquabj - Mughal dagger.
Phari—Mughal shield.
Pharsa—Battleaxe.
Phool—A Rajput weapon.
Pinaka—Bow of Siva.
Pipala—A part of hilt.
Piyazi—Onion-shaped mace.
Prabhu durga—Divine fort.
Prastaka—Barbed arrow.
Pratyalidha—Position of archery.
Pur—City.
Pustakhar—Back scratcher.
Putala—Image or body of the pommel.
Pyjama-Zira—Trouser-shaped armour.

Q

Qabchah—Long gown or shirt.
Qabzah—Hilt.
Qalander—A type of arrow.
Qamchi-Kard—A weapon.

R

Ramjanki—A type of gun.
Ranak—Horse armour.
Rangin—Coloured gun.

Ratha durga—Chariot fort.
Rathamusala—A chariot hurling stones.
Ratna prakara—Ramparts studded with jewels.
Roda—String.

S

Sago palm—A type of wood.
Sahaya durga—Friendly forts.
Saif—A Sikh sword.
Sainti—Spear.
Sakela—A variety of steel.
Sakti—A type of spear.
Saliabah-i-Qalmaqi—A type of knife.
Salil durga—Water fort.
Samapada—A pose of archery.
Sama Sandhan—Holding the string of the bow.
Samshir—Persian sword.
Sana—Bow string.
Sandhan—Holding the bow-string.
Sangin—Gun fitted with bayonet.
Sank or Sang—Spear.
Sara—An arrow.
Sarvamandir—A ship.
Satvika—Pulling of the string.
Sandhayah—Towers.
Sankata durga—Emergency fort.
Saradi durga—Autumnal fort.
Sataghnis—A machine slaying a hundred warriors.
Sayak—An arrow.
Sahjahani—A variety of hilt.
Sharashana—A variety of bow.
Shaspar—Lung tearer.
Shast—Finger stall.
Shastri—Sword.
Sherbacha—Carabine.
Sher-Mahi—Lion fish.
Shikargah—Hunting scenes.
Shilimukha—An arrow.
Shisham—A variety of wood.
Shranga—The bow of Lord Vishnu.
Shutari—Camel-driven.
Shutarnal—Camel-gun.
Siba—Immovable tower.
Siham—An arrow.
Sinhakarni—Holding the bow string.
Sisoo—A variety of wood.
Skanda—Pulling of the string.
Snayu—Gut.
Sosankatta—A Maratha weapon.
Sota—A Rajput weapon.
Srigarbha—A variety of sword.
Sthira—Bow target.
Stri—An arrow.
Suchimukh—A variety of arrow.
Sudarshan chakra—Discus of Lord Vishnu.
Sufar—Curved side of the stave.
Sukha—Dry moat.
Sula—A type of spear.
Sunar—Goldsmith.
Suranga—Mine.
Suryamukh—Dazzling arrow.

T

Tabar—Battleaxe.
Tarkash—Quiver,
Taur or Tor—A creeper.
Tegha—Broad Sword.
Tholie—A part of hilt.
Thuth—Blunt-headed arrow.
Tir—Arrow.
Tirandaz—Archer.
Tkeri—Bow.
Top—Cannon.
Torana—Gateway.
Toredar—Muzzle-loading gun.
Trisul—Trident.
Tschehouta—A weapon.
Tsonak Dao—A type of sword.
Tukkah—Blunt-headed arrow.
Tula—A design in damascening.
Tulugama—A battle array.

U

Udaka durga—A fort surrounded with a water moat.

Upjap—Intrigue.

Urdhva Sandhan—Position of holding the string.

Ustak—Sharbrasque.

Uzbeg Kard—A long dagger.

V

Vajralep—A poison.

Vajramusthi—Holding the string.

Vana durga—Forest fort.

Vatsa Karna—A type of arrow.

Vijaya—A name of sword.

Vikata—A position of archery.

Viraswarga—The heaven attained by the martyrs.

Vishampada—A pose of archery.

Vishayana—A name of sword.

Vishikha—An arrow.

Vyaya—Pulling of the string.

Vyuha—Battle arrays.

W

Wootz—Steel.

Y

Yajna—Sacrifice.

Yakbandi—A sword.

Yali—A variety of wood.

Yamatyarjuna—Archery game.

Yanthong Dao—A type of sword.

Yantramukhi—Mechanical weapons.

Yare Vafadar—A name of sword.

Yuddha durga—Battle fort.

Z

Zafar Takiya—A weapon to be kept under the pillow.

Zaghnol or Jaghnol—A Rajput weapon.

Zag—Mineral.

Zamburak—Matchlock.

Zamzama—A cannon.

Zar-nishan—A design in damascening.

Zih—String.

Zihgir—Finger stall.

Zira—Armour.

Zirih—Armour.

INDEX

A

Ab, 150.
Abhilashitartha Chintamani, 77.
Abor-tribe, 264.
Aboriginal tribe, 38 ; arrow, 38.
Achal, 6 .
Aconite poison, 264.
Adda-ul-Harab was Shajaat-Fakh-i-Mudabhir, 244.
Adam Shah, 48.
Adha Sandhana, 67.
Adham weapon, 40.
Adi archery, 72, arrow, 72, bow, 64, 264. *Dao*, 262, functions of the bow, 64, material, 64, Shield, 266, Spike wristlet, 262, spear, 260, Sword, 262, technique, 90.
Adi Varaha Cave, 3.
Adze, 17, 18,—axe, 33, Indus, 24.
Aerial navigation, 248.
Aftab-i-Alam, 170.
Afzal Khan, 185.
Agate, 196.
Agathokleia and Strato, 107.
Agni, 40.
Agnidiptimukhani arrow, 41.
Agnimitra, 105.
Agni Purana, 40, 139, fort, 239, position of shooting arrows, 67.
Agramandir Ship, 248.
Ahichchhatra, 3, fort, 226.
Ahmadnagar iron spikes, 237.
Ahmad Shah Abdali, 182, 205, Sword, 89.
Ain-i-Akbari, Battle-axe, 156 ; Gun, 171 ; *Gupti-Kard*, 163, Sword, 87, Weapons, 47, 48, 116, 170.
Airakina (Eran) fort, 226.
Aitereya Brahmana, 40.
Aiti, 185.
Ajanta, archery 74, 78, arrow, 111, 112 ; battle-axe, 104 ; Boat, 114, 249, 250 ; bow, 111, 112 ; Cavalier, 114 ; *chakra*, 112 ; chopper, 85, 112 ; dagger, 111 ; *dao*, 85 ; elephant, 112 ; elephant-rider, 111 ; helmet, 112 ; hilt, 85 ; infantry, 111, 119 ; *Khadga*, 85 ; *Khanda*, 85 ; *Khukari*, 85 ; lance, 111, 112 ; navy, 112, 147 ; pommel, 85 ; Quiver, 98, 111, 112 ; saddle, 112 ; scabbard, 85 ; scimitar, 111 ; sheath-blank, 85 : shield, 111, 112, 113 ; soldier, 85 ; spear, 100 ; spearsmen, 114 ; sword, 85, 111, 112 ; belt, 85 ; characteristics of, 85 ; varieties of, 85 ; trident, 113 ; war horses, 113.
Akasajanani fort, 219.
Akbar, 37, gun, 171, personal gun, 171.
Alabaster, Indus, 24.
Alamgir, 89, sword, 89.
Almani, 153.
Alexander, 222, 83, archery, 74, invasion, 71.
Alidha-pose, 67, 141, archery, 66, 67.
Alin*a* copper plate, 46.
All purpose tool (anthropomorphic figure), 34.
Allahabad, 243, weapons mentioned in pillar inscription, 84, battle-axe, 44, 84, siege, 243 ; sword, 102.
Almeida, 255.
Alka and Palka forts, 245.
Alwar Museum, 177. (see Arms-Collections).
Amaravati, 67, archery, 42, 77, 218, Sword, 84.
Ambidextrous archer, 97.
Ame, 173.
Ammunition chest, 16, pouches, 199, 202, Sikh, 197.
Amogha, 138.
Amritsara, 201, 207, foundry, 207.
Amukta weapons, 40.
Anant, 45.
Ancient Indian navy, 251.
Andhiari, 168.
Andhra, boat, 250, guns, 249, navy, 249.
Angrakha, 162, 167.
Animal-shaped hilts, 90, pommels, 121.
Ankai-Tankai fort, 239.
Ankariadar arrow, 58.

Ankush, 178, 190, Maratha, 189.

Antelope horn's handle, 127.

Antennae Sword, 29, 32, 81, 82, Casting, 33, features, 82, function, 33, hilt, 33, shape, 33, style, 33.

Anthropomorphic figures or all purpose tool, 34, purpose 34.

Antialkidas, coin, 100, helmet, 106, sword, 100.

Anvil method, 10.

Aornos fort, 222.

Appollo, 95, as archer, 95, on coins, 95, with quiver, 95.

Apratihata, 6.

Apsarp, 240.

Arab, 3, 105, 185, invasion, 252, navy, 252.

Arabah, 174.

Arabi-hilt, 151.

Aradam sword, 153.

Aramukh sword, 55.

Arapusta sword, 153.

Arayasha boat, 253.

Archer, 41, 47, 71, 94, 138, 182, 223, 225, type, 3, 98, Mauryan, 98, Mughal, 71, on coins, 94, on Gupta coins, 96, Poros, 71, tribal, 264.

Archery 3, 36, 40, 44, 45, 48, 49, 77, 185, *Adi*, 72, *alidh*, 66, anteler, 36, 62, auspicious day, 40, Bengal, 78, *Bhil*, 72, bone, 36, Borobudur, 78, Chalukyan Jaina images, 78, chariot, 74, contraction, 56, *dadurkram*, 66, eight positions, 61, eighty four games, 77, elephant, 74, function, 77, *gaurdakram*, 49, 66, holding of bow string, 56, horse, 74, how to begin to learn, 66, hunting, 78, 95, importance, 50, ivory, 36, *kakadhvani*, 56, Konarka, 78, *malvidyadhana*, 77, Mandsore, 78, material, 36, *matsya-bheda*, 77, maxims from *Risala-i-tir-o-kaman*, 71, mechanism, 36, *meghadhvani*, 56, modes of shooting, 45, 49, 56, mounted, 74, 95, Nadir Shah's game, 78, on Indo-Bactrian coins, 95, 178, on Indo-Greek coins, 95, 178, operational method, 66, origin and development, 36, 41, *Padmasana*, 66, Pattadakal, 74, *Pratyalidha*, 66, pre-Mauryan, 41, pulling of string, 56, *samapada*, 66, sacred game, 77, sources, 40, sound, 56, stone, 36, story of *Shravan Kumar*, 98, targets, 56, twirling, 56, Udaigiri caves, 46, *Vaishakh*, 66, *Vinadhvani*, 56, Vedic, 74, 77, *Vishampada*, 66, wood, 36, *Yamatyarjuna*, 77.

Arcot siege, 244.

Ardhachandra arrow, 55, 56, 139.

Arista, 6.

Arjuna, 1, 49, 77, *Gandiva*, 40.

Arka for bow string, 63, Kautilya, 63.

Armed forces, 75.

Armour, *angarakha*, 167, back, 167, *bhanju*, 167, chained, 167, cotton, 168, damascening, 130, decoration, 123, elephant, 169, foot, 170, heavy, 167, Indus, 25, iron, 125, *jaibah*, 167. *Jamaa-i-fatahi*, 167, *Joshan*, 167, Kalidasa, 144, *Kamal*, 167, *Kantha shobha*, 167, mail shirt, 75, ornamentation, 132, padded, 127, 168, scales of animals, 6. Sikh 198, 199, silk, 168, studded with iron spikes, 167, style, 25, tribal, 266, use, 165, varieties, 167.

Armoury, 156, 231, Sikh, 199.

Arms Collection, 34, 58, (see separate list).

Arms Gallery, 58, 89.

Arms Guard, 186, 197.

Army, 50, Ajanta, 111, 147, Gupta, 147, Kalidasa, 147, Maratha, 50.

Arrian, 1, 95.

Arrow, aboriginal, 36, *Adi*, 64, *agnidiptamukhani*, 41, *ankariadar*, 58, *aramukha*, 56, *ardhachandra* 56, arrow puller, 58, bamboo, 38, barbed, 2, 31, 45, 64, 95, 96, Basoli, 38, *batsadanta*, 56, *bhalla*, 56, 140, blazing, 138, blunt, 48, 58, 66, bone, 42, 63, bronze, 20, Central Asian, 43, chert, 43, *chobha*, 43, *churapra*, 56, coins, 37, 94, 95, concave-based, 62, crescent-shaped, 49, 177, declaration, of war, 41, defects, 71, *dhanusha*, 41, *dhola*, 38, *domuhanah*, 58, double-tanged, 42, *drauna*, 41, *dvibhalla*, 56, feathers, 49, 63, 71, 95, 98, 140, from *dastur-ul-Insha*, 58, from literature, 56, for children, 38, for practice, 58, for shooting birds, 265, for witchcraft, 78, four-headed, 2, function, 63, *gaudh*, 1, *ghera*, 58, globular, 2, 43, *gulula-i-tufang*, 47, hafting, 62, hollow socket, 2, 43, horn, 62, Indus, 20, 36, 37, 62, inscribed, 44, 47, 140, iron, 125, 154, 140, ivory, 42, Kalidasa, 98, 139, *Karmuka*, 41, *Karnika*, 56, *Khag*, 56, *Kodanda*, 56, 41, 138, *Kohartarash*, 58, *Kshurapra*, 140, *lais*, 58, leaf-shaped, 2, length, 50, 58, longenze-cross section,2, 42, material (*sara*, reed, iron metal, ivory, bone) 62, 63, 64, 125, 138, 152, measurement, 21, metal, 62, *naft*, 46, 47, *napunsaka*, 56, *narach*, 1, 63, 140, neolithic, 62, notch, 71, *naktab*, 58, Orissa, 38, *paikhankash*, 58, paleolithic, 62, piercing, 48, *Pinaka*, 62, poisoned, 43, 63, 78, 264, punch-marked coins, 37, 94, 95, *purusha*, 56, *Qalandar*, 58, reed, 63, 265, rhombic, 42, *salaka*, 1, 138, Sanchi, 96, *sara*, 1, 63, *shabdbedha*, 47. shallow-tailed, 21, 55, *shan*, 1, 138, shooting birds, 48, Sikh, 195, small, 177, spear-shaped, 98, *sranga* ,62, stone-age, 43, 62, *suchimukha*, 56, *suryamukh*, 41, symbolic, 48, *tarah-i-badam*, 58, *tarah-i-bhallah* 58, *tarah-i-hilai*, 58, *tarah-i-khaki*, 51, *tarah-i-khar*, 58, *tarah-i-khormi*, 58, *tarah-i mah*, 58, *tarah-i-toko*, 58, Taxila, 42, 43, ten names, 41 *thuth*, 58, *top*, 47, triangular, 2, *tufang*, 47, *tukkah*, 57, two cutting edges, 98, types, 41, 56, 58, 155, use, 50, variety, 57, 'V' shaped, 56, Vedic, 37, *venu*, 1, 138, *vishikha*, 146 weight, 56.

Arsenal, 239, Sikh, 202.

Artak-i-Kajim, 168.

Artemidorous coin, 95.

Arthasastra, 6, fort, 224, navy, 249.

Artifacts, 10, copper-hoards, 31.

Artificial staircase, 241, fort, 214, 216, 241.

Artillery, 117, 172, 186, fort, 239, Mughal, 116, Sikh, 199, 201, 203.

Aryamitra, 98, of Ayodhya, 96, of Audambara, 96, spear, 98.

Asadullah, 87, 120.

Asayasha, 235.

Ashuga, 138.

Ashvamedha, 40.

Asoka, Navy, 249.

Asyasthi, 83.

Atekari, 185.

Atharvaveda, 40, bow-string, 63, fort, 216.

Atta, 218, fort, 218.

Attack on Puri, 249.

Attalaka, 220, fort, 216, 218,

Attirampakkam, 7.

Audaka, 224.

Aurangzeb, 48, 117, 151, 160, sword, 89, *Uzbeg-Kard*, 164.

Avantivaram, 45, 46.

Awl or borer, 9, 10, 15.

Axe, 3, 17, 44, Copper-hoard, 16, 34, decorated, 125, Dunria, 32, Gungeria, 32, 34, grinding, 16, inserted in an anteler sleeve, 16, Jaina painting, 112, long and narrow, 24, Maratha, 189, short and broad, 24, silver, 157, Sarthaulli, 32, types, 24.

Axial Center, 26, Indus, 26.

Ayadakatti, 5.

Ayamarda, 240.

Ayodhya, fort, 217, city wall, 217.

Ayudha-purusha, 104, on coins, 104, *Chakra-purusha*, 104.

Azam Shah, 239.

Azam Tara fort, 239.

Azes I, 1, 41, 74, II, 1, 41, 74.

Azisiles, 1, 41, 74.

B

Babar, 5, 170, fire arms, 170.

Babarnama, 116, 253, navy, 253, sword, 86, 87, war, 116.

Back armour, 123, 167.

Back plate, 166, Sikh, 197.

Back scratcher, 123.

Badami sculptures, 186.

Badijah, 174.

Bagh caves. 3, 5, 45, 112.

Baghnakh, 185, 189, 196.

Bahadur Shah of Gujrat, 47.

Bahadur Shah II, 164.

Bahar-i-Ajam, 244.

Bahumukh, 146.

Bairagi crutch, 186.

Baji Rao, 187.

Bakhtar, 165, *chahar-ainah*, 166, varieties, 166, *zirih*, 166.

Balas tribal, 258.

Bala tung, 168.

Balirajgarh fort, 299.

Ballam, 161,

Balls of brass, iron, wood, stone and zinc, 207.
Bamboo, arrow, 38, 264, bow, 177, quiver, 64,
  shaft, 261, shield, 266, spike, 267, string, 265.
Bana, 138, 139.
Banda Bahadur, 50, 195.
Banduk or *Bandook*, 5, *chakmak*, 204, *masaladar*,
  205, Sikh, 265, *pathar-kala*, 204.
Bandtar, 150.
Baneh, 162.
Bank, 161.
Banner, 147, 185.
Barachha, 46, 144. 180, 185, function, 180, iron, 125,
  price, 158, Sikh, 196, shape. 158, *shakti*, 99.
Bara Jamdadu, 183.
Barbed arrow, 2, 31, 33, spear, 24, 31, 34.
Bar celt, 31, 32, copper hoard, 30, Gungeria, 32,
  Orissa, 30, shape, 24, size, 34, West Bengal,
  30.
Barrel, 171, 203.
Barudkhana, 174.
Base ring cannon, 173.
Basholi painting, 38, arrow, 38.
Bastion, 226, 227, 236, 242.
Batasa or pommel, 151, 152.
Batsadanta, 55.
Battering rams, 146, 244.
Battery, 188.
Battle code, 148.
Battle, bow and arrow, 49, Bhangini, 194, Buxar,
  199, Chandawar, 47, Hydespes, 248, Kanauj,
  253, Narmada, 249, Panipat, 50, 112, sword,
  85, scene, 85, Thatta, 253.
Battle arrays, *achal*, 6, *aprathata*, 6, *arista*, 6.
Battleaxe, 125, 146, 156, 157, 178, 179, 264, Ajanta,
  104, coins, 94, 103, 104, decoration, 125, 150,
  156, function, 103, inscription, 104, 155, *jaghnol*, 156, Maratha, 189, Nadir Shah, 156,
  shape, 156, *tabar*, 156, *tarangalah*, 156, type,
  103, use, 156, varieties, 156, wood, 125.
Battlements, 223, 224, 226.
Battered brick revetment, 229.
Bayana hoard, 44.
Begram ivory, 77, game, 77.
Belt, 174, 266, leather, 26, 125, 174, golden, 47,
  sculpture, 85, sword, 85.
Besnagar fort, 227.
Bengal navy, 251, 255.
Bhaddasal Jataka, archery game, 77.
Bhala, 99, 144, 180, arrow, 140, from Sanskrit literature, 99, operation, 143, style, 143, types,
  55, (also see *ballam*, *barachha* and spear).
Bhanju, 161, 167.
Bharhut sculptures, 39, 67, 81, belt, 84, bow, 59,
  hilt, 84, quiver, 84, scabbard, 84, sword, 84.
Bharmar gun, 204, 205.
Bharatpur fort, 243.
Bhelhetah, 161.
Bheri, 6, 147, 161.
Bhidchir, 5, 179, 184, 189, 196.
Bhil, archery, 72, 266, bow, 266.
Bhindipala, 145.
Bhir mound, 43.
Bhubanesbwar, 46.
Bhudargad fort, 245.
Bhujya navy, 248.
Bichhawa, 4, 178, 184, 196.
Bidar iron spikes, 237.
Bidri, 134.
Bifacial point, 15.
Bijapur iron spikes, 237.
Bimbsarpuri fort, 221.
Bini, 151.
Binkhi arrow, 266.
Bird feathers, 267.
Blades, 4, 152, 196, iron, 125, parallel sided, 12,
  preparation, 129, *Sirohi*, 89, spear, 261, technique, 12.
Blank sheath, 85.
Bloom steel, 129.
Boar tusks on helmet, 267.
Boat, Ajanta, 114, 249, 250, 253, Andhra, 249, 250,
  armed with iron spikes, 252, *Boora*, 250, East
  India Company, 250, Indus, 27, 247, Jagannath temple, 249, Mauryan, 249, Mohenjodaro,
  250, names, 253, *Patella*, 250, Sanchi, 249,
  through the ages, 250.
Bodhisattva, 67.
Body armour, 166, 180, Indus, 25, Sikh, 198, tribal,
  247,.
Body guard, 170.
Bolt, 237.
Bombardment of Dinanager, 202.

Bombshell, 187.

Bone, 10, 63, 196, arrow, 63, decoration, 127, sword, 83, Taxila, 42.

Book on archery—*Risalah-i-tir-o-Kaman*, 71.

Boomrang, 56.

Bore, cannon, 171, 173, 178, 188.

Borer or awl, 9, 15, cum scraper, 15.

Borobudur, 45, boat, 249, 250, navy, 249, sword, 8 , temple, 249.

Boundary wall of Rajgriha, 221, guards, 226.

Bow, 2, 3, 36, 38, 40, 42, 43, 45, 46, 49, 55, 59, 66, 72, 75, 95, 96, 137, 155, 161, 177, 182, 190, 193, 197, *Adi*, 64, Ajanta, 39, 111, 112, *Arjuna*, 1, *arka*, 63, Bagh caves, 112, bamboo, 178, 182, Bharhut, 39, *Bhil*, 178, bowman, 74, 138, bowcase, 95, buffalo horn, 63, cane, 49, 59, 125, *chapa*, 63, coin, 94, 95, 96, 97, 98, curved, 59, 96, 177, cross-bow, 177, damascened, 57, *daru*, 63, decorated, 57, 125. *dhanusha*, 1, 46, *drauna*, 1, 46, embroidered, 48, fastening, 63, function, 63, *Gandiva*, 40, *gaudh*, 49, gilding, 63, Greek, 41, gripping-ways (*muharraf*, *murabba*, *changal-i-baz*), 72, 96, hide (cow, buffalo, deer) 63, Indo-Greek coins, 95, Indo-Scythian coins, 39, in painting, 49, inscribed, 59, iron, 125, jewelled, 48, Kalidasa, 141, *karmuka*, 40, 56, Kautilya, 63, *kodanda*, 1, 40, 56, lacquered, 57, large, 50, long, 42, 46, 48, 178, makers of the bow, 47, Maratha, 190, Mauryan, 42, material, 63, 64, 96, 182, 193, Mughal, 47, 48, 57, 63, *murva*, 63, *narach*, 49, of Shah Jahan, 155, painting, 64, Persian inscription, 59, *Pinaka*, 40, 67, polishing, 63, positions, 49, 71, price, 48, pulling, 71, punch-marked coins, 39, 94, 95, ring, 64, 96, 136, *sana*, 49, 63, *salaka*, 49, *sara*, 49, simple, 177, Siva, 1, Sikh, 193, 195, small, 47, stave, 64, 71, steel, 63, 182, stretched, 177, string, 63, 64, string-holder, 64, string-pulling, 71, *tala*, 63, target, 71, Taxila, 95, through, the ages, 39, tribal, 39, 264, triple-curved, 177, types, 55, 95, 177, unstretched, 46, 59, 177, varieties, 96, *venu*, 41, 63, varnishing, 64, Vedic, 40, Vishnu, 1, with Krishna, 49, wielding, 96.

Bowl or pommel, 152.

Brahmana fort, 215.

Brahmana Chach, 252, navy, 252.

Brahmanda Purana, 216.

Brahmayamala fort, 230.

Brahmadutta archer, 78.

Breast-plate, 1, 41, 145, 166, design, 116, ornamentation, 132, Sikh, 197.

Bridge over ditch, 216, Hydespes, 248.

Bronze, arrow-heads, 20, 22, 24, 36, 43, Indus, 22, knives, 125, mace, 24, Maratha, 125.

Brown Bess, 203.

Buckles, 198.

Budga Kard, 163, presentation, 164.

Budgaro Ship, 254.

Bulat, 128.

Bullets, 127, 174, 181, 197, 244, case, 127, Sikh, 197, velvet, 127.

Bulb of percussion, 8, 11.

Burha Khanda, 264.

Burial ground, 225.

Burin, 9, 10, 16.

Butt, axe, 24, Indus, 12, spear, 260.

C

Calibre, 173, 188, 202, 206.

Camel-Sviwels, 191, 202, 203.

Camp, 150, circular, 6, rectangular, 6, square, 6.

Cane helmet, 266,

Cannon, 5, 120, 125, 170, 188, 207, 244, at Agra, 172, Chamber, 173, depth, 173, diameter, 173, furnace, 173, inscribed, 206, length, 173, Mughal, 172, Sikh, 201, 206, size, 172, *Zamzama*, 200.

Cap of mail, 198

Cavalier, 6, 47, 143, 147, 158, 167, 172, Afghan, 50, Ajanta, 112, 114, archery, 75, battle, 185, fort, 239, Maratha, 50, on boat, 114, Sikh, 196.

Carbine or Carabine, 175, Sikh, 205.

Cartridges, 6, 207.

Cart, 174, on wheels, 243, with arrows, 243.

Cast iron, 129, Antenna sword, 33, Harappan, 31, Indus, 26.

Catapult, 258.

Cave, 125, Adivaraha, 3, Gudiyam, 7, Mirzapur, 33, painting, 33.

Celts, 26.

Central Asian, 150, arrow, 37, antiquities, 37, concave-sided triangle, 43, flat head, 43, having

obtuse point, 43, hollow side, 43, with or without tang, 43.
Centres of ornamentation (Delhi, Jaipur, Sirohi), 132.
Chandragupta Vikramaditya, 249, navy, 147.
Chahar-aina, 166, 186, 187, cuirass, 187.
Chained armour, 167, Sikh, 198.
Chakkar Sada, 197.
Chakra, 5, 49, 194, 196, Ajanta, 112, *Katavadar*, 197, on coins, 44, 106, operation, 197, *Sudershan*, 104.
Chala, 71.
Chalachal,
Chalcolithic, 36, arrow-heads, 43.
Chambers, 256, cannon, 173.
Chakmaqi, 157.
Chain armour, 199, Sikh, 197, Maratha, 187.
Characterstics of defective arrows, 71.
Chap, 137, Kautilya, 63.
Chaqu, 164, *chaque*, 162.
Charak or cross-bow, 48.
Chariot, 6, 41, 46, 74, 117, 138, 150, 225, roads, 225, archery, 74, charioteer, 137, 147.
Charqab, 160.
Cherty limestone, 24.
Chaturangini, 147.
Chaturmukha, 23.
Chanho-daro, 24, 26, 31, 33.
Chert arrow, 38, flakes, 25.
Chura, 4, *Churi*, 4, Sikh, 196.
Chilanum, 183.
Chilah or string, 155.
Chisel, 17, Indus, 26, tools, 9, types (square, rectangular, round), 18.
Chitraduskhar game, 78.
Chittor fort, 241, sieze, 171, spikes, 237.
Chobha arrow, 38, 266.
Chola fleet, 251, navy, 251.
Choppers, 5, 7, 9, 11, 12, 18, 112, Ajanta, 112, tools, 9, 12, types (hemispherical, large, massive, unifacial), 12.
Chowk, 151.
Chuga, 180, Sikh, 196.
Citadel, 220, Indus, 19, 24, gates, 218, city fortification, 218, city wall, 217.
Clactonian flake, 13.
Class-knife, 164.
Clay-boat, 27.
Clay missiles, 24, Indus, 24, types, 24.
Cleaning of the blade, 130, 132.
Cleavers, 1, 5, 7, 8, 14, 16, 31, 164, types, 14.
Club, 264, on sculptures, 105, tribal, 263, with spikes, 264.
Clumsy bow, 185.
Coat of mail, 6, 120, 145, 166, Sikh, 198.
Coins, 37, 44, 95, 96, 101, 102, Akbar, 37, Andhra, 41, Apollodotus, 95, archery, 3, 41, 44, 78, arrow, 94, Azes, 99, battle-axe, 94, 103, Bhumaka, 95, boat, 250, bow, 59, *Chakra*, 94, curved arrow, 94, dagger, 101, 102, Demetrius, 95, Diodotus, 99, elephant-goad, 94, Eukratides, 95, 99, flag, 101, Gautamiputra, 95, Gupta, 102, Heliocles, 99, 150, Huviska, 101, Indo-Bactarian, 1, 99, 102, Indo-Greek, 99, 102, Indo-Parthian, 41, 99, Indo-Persian, 37, Indo-Scythian, 1, 39, 84, 111, javelin, 99, 100, 102, lance, 99, Mathura,-rulers, 105, Maus, 95, mace, 104, Menander, 99, 106, Nahpana, 96, navy, 249, Pandiyan, 101, 102, pommel, 102, Punch-marked, 37, 39, 41, 83, 95, purpose, 93, sceptre, 84, shield, 94, source, 94, spear, 94, staff, 84, sword, 83, 84, 94, 101, 102, thunderbolt, (Bhumaka, Demetrius II, Diodotus, Menander, Nahpana), 106, tribal, 37, 39, 44, 84, trident 84, 94, 101, 105, types, 100 Vijayanagar, 102, weapons, 102, Zoilus, 95.
Colouring, 130.
Combustile material, 6.
Confronting soldiers, 116.
Concave-flake, 8, scraper, 15.
Convex tools, 16.
Copper, arrow-heads, 43, Indus, 25, axe, 16, 25, powder-flask, 125, tools of copper hoards, 21, 29, 30, 31, 33, 34, mace, 24, spear, 23.
Core, 7, 9, 10.
Cotton, 196, belt, 168, garment, 41, pads, 145, 198.
Crescent-headed arrow, 43, 177, blade, 261, hilt, 90.
Crocodile skin, 224, shield, 127.
Cross-bow, 3, 48, 57, 146, 177, 182.
Crucible, 130, 131.
Crystal, handle, 127, 130, hilt, 4.

Cuirass, 6, 160, 187.
Curved bow, 94, dagger, 184, pattern-welding, 131.
Cutlass, 197.

D

Dabhoi iron spikes, 237.
Dadurkrama, 66, 67.
Dagger, 3, 4, 45, 75, 120, 143, 158, 183, 262, damascening, 130, decoration, 125, double-edged, 3, iron, 82, ivory, 4, 127, Indus, 22, 26, *lahariyadar*, 4, Maratha, 189, 190, on coins 99, 101, 102, sheath, 4, single-edged, 3, Sikh, 197, small, 46, types (knife, dagger, narrow double-edged, shouldered, with mid-rib), 22, with trident, 4, with zig zag blade, 178.
Daivata fort, 231.
Damascening, blade, 129, helmet, 166, in gold, 131, lustre, 130, names, 128, of Jaipur, 177, plates, 168, shield, 123, Sikh, 198, 199, steel, 187, sword, 129, technique, 128, type, 130.
Dandasana, 138.
Dandayat, 67.
Dao, 3, 90, 262, 267, Ajanta, 85, without point, 262.
Dara with his army, 49, 75, 118.
Daroga-i-zamburkhana, 201.
Daru, 63, 136.
Dastanah, 169.
Dasti, 150.
Daultabad fort, 243, iron spikes, 237.
Dauraricks or trumpets, 222.
Defects in fort, 239.
Decoration, 120, 180, arrow, 125, axe, 125, bow, 125, battleaxe, 125, *gurj*, 125, mace, 125, material, 153, powder-flask, 124, scabbard, 126, *shashpar*, 125, spear, 261, sword, 125, *zaghnol*, 125.
Defensive armour, 197, Sikh, 197.
Defensive mechanism, 258.
Defensive weapon, 197.
Dehi or defence wall, 214.
Delhi fort, 218.
Delhi magazine, 202.
Delhi ornamentation, 132.
Delhi Shahi, 151.
Deities with shield, 107, Pallas, 107, Zeus, 107,
Demetrius II, coin, 106, spear, 99, thunderbolt, 106.
Demolition of forts, 245.
Deogarh sword, 44, 84, 141.
Derah or Camp, 201.
Derby ship, 255.
Designs, 153.
Desert fort, 231.
Detonating caps, 202.
Devi-purana, fort, 216.
Dhanukh, 1, 47, 56, 60, 47, 147, *dhanu*, 136.
Dhanurveda, 1, 38, 40, 62, 66, 71, 83, 96, 98.
Dhanva Durga, 217, 230.
Dhara, 156.
Dhas, 4.
Dhup or straight sword, 153.
Diameter, cannon, 173, muzzle, 173.
Diamond, 127, 132.
Digit, 27.
Direct percussion technique, 10.
Dirk, 34, decoration, 125, sword, 19.
Ditches, fort, 218, bridge, 216, 224, 239, 240.
Discus, 41, 112.
Dockyard, 27, Lothal, 247, plan, 248.
Dohla arrow, 38.
Dohra gurj, 180.
Do-muhanah arrow, 48, 58.
Dophia arrow, 266.
Dora sword, 153.
Dosnu-arrow, 266.
Double, edged arrow, 155, barrelled, 205, latches, 190, Maratha, 190, pharsa, 189, sword, 141, 182.
Dradha, 215.
Dragoon, 205.
Drauna, 41.
Drava, 77.
Dridha, 67,
Drill, 150.
Drmihta, 215.
Dronaka, 232.
Drum, 6.
Dry moat, 220.
Dulchar, 265.
Dumala, 152.

Dumehi, 168.
Dunria-axe, 32.
Durasad sword, 83.
Durbar, 120.
Durga, 78, 117, 193, 214, 215, 224, 232.
Durust andaz, 171.
Dushmankush, 89.
Dvaichal, 71.
Dvibhalla, 55.

E

Earthern rampart, 226.
East India Company ship, 250.
Ebony cap, 204.
Edge, 152.
Egypt, 1, 21, 23, 24, 36, 62, sword, 82.
Ekamukha fort, 231.
Eklavya archer, 77.
Ekpananna Jataka, fort, 219.
Elephant, Ajanta, 112, armour, 165, 169, fort, 239, frontlet, 244, rider, 111, siege, 244.
Elephant-goad, 125, 157, 190, two-pronged, 190, on coins, 94.
Elliot sword, 33.
Ellora, 3, 46.
Elongated handaxe, 12.
Embankment, 248.
Embroidered scabbard, 122.
Emerald, 127, 132.
Enamelling, 121, 132, 163.
Engines, 236.
Engraving, 130, engraver, 132.
Epic, fort, 216.
Epigraphy, navy, 251.
Epug, 264.
Eran fort, 226.
European system of war, 188.
Evidence of human sacrifice, 227.
Eye or hole in the tang, 31.

F

Fabricators, 18.
Factories, 202.
Fank, 89.
Farasas, 4.
Farmayasa boat, 253.
Fatehgarh, 32, 33, 34.
Fateh-jung, 206.
Fateh-laskar sword, 89.
Fatila, 203.
Feathers, 41, 63, 127, 138, 140.
Field gun, 174, 201, 203.
Fire arms, 30, 125, 170, 180, 187, 205, 248, 264.
Fishbone handle, 127.
Fishing arrow, 1.
Flail, 162.
Flag, 101.
Flake, 7, 8, 10, 11, 12.
Flintlock, 203, 204, 205.
Flint-prototype, 36.
Flota Naga, 263.
Flotilla of boats, 248.
Foot armour, 170, 199, guards, 123, soldiers, 42.
Forging of steel, 130.
Fort Monroe sword, 81, 82.
Fort, architecture, 232, Azam Tara, 239, Ankai Tankai, 239, Balirajgadh, 229, burning by fire, 240, characterstics, 232, common features, 232, defects, 239, *dhanva*, 230, destruction, 214, engines, 236, fortification, 236, garrison, 238, gates, 239, Ghoragad, 239, Gingee, 239, guard, 236, gun, 236, 239, Hadsar, 239, implements, 236, Indus, 212, Kamalgad, 237, kinds, 231, material, 232, Mauryan, 223, 226, minor, 239, Nagarjunakonda, 229, natural protection, 236, of iron, 215, of stone, 215, origin, 212, Panhala, 239, *parvat* 230, *parikha* or *parigha*, 230, preventing engineering, 239, Rajgir, 221, Ratangad, 239, repairs, 226, 239, *sahaya*, 230, *sainya*, 230, selection of site, 236, Singhgad, 239, soldiers, 236, Sishupalgadh, 229, stores, 117, Sundergad, 239, Sukranitisara's account, 230, technique, 232, *vana*, 230, vedic, 214, wall, 222, 236.
Foundary, Amritsara, 207, Kashmir, 207, Kotali Loharan, 207, Lahore, 205, 207, Sikh, 202, Wazirabad, 207.
Fowling gun, 174.
Fuller, 102.
Furnace, 129, 173.
Furrow, 152.
Fuses, 201, 202, 207.
Fuzil, 202.

G

Gada, 49, 146, 155, 186.
Gadbang or case, 264.
Gaddara, 153.
Gajghao, 178.
Gajnal, 174, 206.
Gallong tribe, 265.
Gandhara, 41, 84.
Gandiva, 1, 40, 49, 118.
Ganga Jamuni, 80, 132, 133, 168.
Gardani, 162, 168.
Garguj, 156.
Garj or *Gurj*, 186.
Garo, battleaxe, 264, club, 263, tribe, 263.
Garrison, 203, 239.
Gate, 222, 225, 239, gateway, 227.
Garudakrama, archery, 66, pose, 67.
Gataka, 180.
Gaudh, 1, 41.
Gauntlet – *Naga sword*, 89, 90, hilt, 182.
Gems on Scabbard, 122.
Ghera, arrow, 58.
Ghabarh, 174, 204, 206.
Ghoshan or corners, 48.
Ghugwah, 161.
Gilota hilt, 90, 151.
Gingee fort, 239.
Girdles, 199.
Giri durga, 217, 219, 230, 232.
Girivraja or Rajgriha, 220, 221.
Glass, decoration, 127, hilt, 4.
Globular, hilt, 90, point, 43.
Goad, on coins, 105.
Gobhan, 57.
Golconda, iron spikes, 237, 237, 245, siege, 242.
Gold brocade, 127.
Gomati fort, 216.
Gomukh, 6.
Gopuchha, 55.
Gopuram, 216.
Goshah, 155.
Graffitto, 22.
Greaves or *Ranak*, 165.
Grinding, 17.
Ground-axe, 16.
Guard room, 227.
Gubarah or mortar, 201.
Gulula-i-tufang, 47.
Gulel 57, 178, 244.
Gulma-fort, 219.
Gungeria, 32, 34.
Gunjayasha boat, 253.
Gupta coin, fort, 227, hilt, 90 sculpture, 39, 81, spear, 100, sword, 101.
Gupti, 4, 178, 190, *Kard*, 162, 163, 164,.
Gun, 170, 171, 188, 199, 200, 242, Akbar, 171, date, 171, forging, 200, five pounder, 200, gunsmith, 176, Maratha, 185, muzzle-loading, 188, number, 171, *rangin*, 171, *sada*, 170, several-pounder, 206, Sikh, 195, 197, 199, 200, 202, 203, six-pounder, 200, twelve-pounder 200.
Gun-barrel, 125.
Gun-carriage, 6, 125, 187, 200, 201.
Gun-factory, 171, foundary, 6.
Gun-fort, 236, 239.
Gun, manufacture, 170.
Gunner, 243.
Gun-powder, 5, 174, 200, 201, 207, 242.
Gun-powder flask, 130, 174, 199.
Gun-powder formula, 5.
Gun-swivel, 5.
Gun-value, 174.
Gurdaspur-fort, 242, 243.
Guerilla, 6, 181, 190.
Gurj or *Gurj*, 4, 125, 155, 156, 264, eight-petalled, 156, double-headed, 156, price 156, Maratha, 189.

H

Habath or howitzer, 201.
Hadiyatur rami, 47.
Hadsar fort, 239.
Hafting, 17, 26, 33, hafted knife, 22.
Hakimkhani hilt, 151.
Halabbi blade, 153.
Hamail, 150.
Hammer, bone, 11, Indus, 26, stone, 11, wood, 11.
Hammerstone, round, 18, plano-convex, 18, square, 18.
Hand armour, 169, 180, 198.

Handaxe, 1, 7, 18, elongated, 12, heart-shaped, 12, lance-shaped, 12, pear-shaped, 12, oval, 12, triangular, 12.
Hand-guard, 123.
Hand-shield, 127.
Handle, 26, Indus, 21, knife, 21, decorated, 125, of iron, 17, wooden, 17, Sikh, 196.
Harappa, 213, citadel, 113 culture, 17, 26, 27, 33, 34, 36, sword, 80.
Harpoon, 31, 38, design, 33, material (bamboo, metal, wood), 33, mould, 31, size, 31.
Hat dhonda or stone, 181.
Hathnal, 174, 206.
Hatta, 195.
Howdah or *howdah*, 74.
Head-dress, 144, 165.
Heavy armour, 167, cannon, 206, gun, 172.
Helmet, 6, 165, 180, 186, 187, Ajanta, 112, damascened, 133, feathered, 127, padded, 166, on coin (Antialkidas, Eukratides, Sophytes), 106, queen wearing, 107, Sikh, 197, tribal, 266, 267, types, (flat, inverted, naturework of chain, oval, round, square), 165, velvet, 127.
Herring Bones, 131.
Hides, 125, 127.
Hilt, animal-shaped, 90, basked-shaped, 90, Bharhut, 84, circular, 91, coin, 101, 102, crescent-shaped, 90, crystal, 4, *gilota*, 90, globular, 90, jade, 88, Irani, 90, ivory, 4, Maratha, 90, material, 83, metal, 88, Mughal, 90, parts, 152, Sikh, 90, silver, 4, soapstones, 4, steel, 88, studded, 34, 134, triangular, 87, 90, types, 151.
Historical swords, Abdali, 89, Alauddin, 120, Hamir Singh, 120, Jahangir, 120, Nadir Shah, 89, Nano Rao, 120, Tipoo, 89, Subhas Chandra Bose, 120.
Historical Weapons, battle-axe, 120, Dagger, 120, Shield, 120.
Holding the String, *kakatundi*, 67, *matsari*, 67, *pataka*, 67, *Sinhakarni*, 67, *vajramusthi*, 67.
Hollow Scrapper, 9.
Hollow Socket, 2, 261.
Hone, 20, 82.
Hooked barb, 31, spear, 32.
Horn, 26, 62, 64, material, 62, hilt, 127.
Horse, 190, archery, 49, 74, 76, armour, 168, horsemen, 111, artillery, 210, trapping, 125.
Howdah or *hawdah*, 3, 45, 47, 125, 169, 179.
Howitzer, 174, 206.
Huda fort, 219.

I

Illustrated Manuscript (*Babarnama, Gauga Dhar, Mahabharata, Tarikh-i-Khandan-i-Timuria, Zich-i-Jadid-i-Mirji Tajak*) 116,
Implement, Indus, 26.
Indian painting, 111, iron, 83, steel, 128, navy, 247.
Indo-Bactrian, 95, 96, Indo-Greek, Indo-Partnian, 41, Indo-Persian 37, Indo-Scythian, 3, 9, 41.
Inam or reign, 163.
Indra, 40, 43, 140, 141, Indraprastha, 213, thunderbolt, 106.
Indus, armour, 25, arrow (function, shape, size), 20, 21, 36, 37, 38, chert, 25, culture, 1, 19, dagger, (knife-cum-dagger, narrow double-edged, shouldered, with mid-rids), 22, 26, fort, 27, 212, implement, 26, knives, (double-curved, hollow, backed, narrow, curved) 21, 22, lance, 24, leather belt, 21, 26, material aspect, 19, material, (bamboo, bronze, copper, cotton, leather, stag's horn, stone, tin, wood), 20, 26, missiles, 25, navy, 26, 247, shield, 25, spear, 23, sword, 19, technique, 26, weapons, 26.
Infantry, 6, 111, 112, 174, 203, 225.
Inlaying, 131, kinds, 131, *tahnishan*, 131, *zarnishan*, 131.
Inscription, arrow, 140, battleaxe, 104, chained rings, 168, spear, 27, sword, 102, 120, 154, 155.
Iron-fort-215, centre (Ispahan, Khorasan, Samarkand), 128.
Irani-popat, 151, hilt, 151.
Iron, hilt, 151, books, 239, history, 128, spikes (Bidari, Ahmadnagar, Dabhoi, Chittor, Churach, Bijapur, Golconda, Poona, 237, types, (black, copper, gold, iron, oily, silver,

white), 62, ornament, 82, origin, 82, weapons (blade, arrow, bow, gun-stock, hilt, barrel, dagger, spear, sword), 82, 125.
Ishukara, 40.
Ishu, 40, 140.
Ivory, 36, archery, arrow, 38, 42, 127, Begram, 77, cap, 204, dagger, 4, elephant-goad, 105, green, gun-stock, 127, hilt, 4, 127, notches, 127, powder-flask, sheath, 153, spear, 127, types (hollow-socketed, 124, rough-shaped with smooth circular point, with trilateral point), 57.

J

Jade, 196, handle, 127, *Jafar takiya*, 4, 153, 199, 190. *jaghnol*, 156, 178, 180, 196, spike, 196, shape and use, 156.
Jahan Kushae Nadiri, 84.
Jaibah, 167.
Jain Kalpasutra, 39, 112, painting, 112.
Jair, centre of ornamentation, 132.
Jalalabad fort, 243.
Jamaa-i-fatahi, 167.
Jamdagnya, 146.
Jamadhar, 159, 184, 189, *daulikaneh* 184, function, 160, Mughal, 158.
Maratha, 160, price, 160, presentation, 160, *sehlikaneh*, 162, *trailikaneh*, 4.
Jambiah or *jambuwah*, 4, 162, 153, 179, 198.
Jamkhak, 164.
Janeo, 152.
Jang Nama, 195.
Janiel, 204.
Jari patta, 185.
Jasper, 127, hilt, 163.
Jataka, fort, 219, sword, 85.
Jauhar, 130, 154.

K

Kadaphises I, 194, mace, 104, kadhana fort, 219, Kadara battleaxe, 264, *kakar*, 89.
Kakatunda, 55, *kakatundi*, 67, kalibangan fort, 19.
Kalidasa, 67, arrows (*ardhachandra*, *bank*, *prastaka sayak*, *shilimukh*), 39, arrows (*bhalla*, *ksurapra*, *narach*), 40, *ashuga*, 134, bowstave (*daru rattam*, *tal*, *sara*), 136, curves, 136, *dhanu*, 1 fort, 230, *karmuka*, 137, *karwal*, 142, *kha* 142, *kodanda*, 137, modes of shooting, 14 *patrin*, 138, spear, 98, 100, sword, 142.
Kalinjar-siege, 242.
Kallur swords, 82.
Kamal armour, 167.
Kaman, 57, *kaman-i-gurohah*, 57, stave, 157.
Kamar jeb 89.
Kamarsal, 150.
Kamathah, 48.
Kandhar siege, 242.
Kangan, 151.
Kangkat armour, 144, Kalidasa, 144.
Kanheri sculptures. 249, boat, 249.
Kaniska, 21, spear, 99, 101, sword, 81, 84.
Kanoj, battle, 46, 253.
Kanhoji Angrey, 255.
Kantha Sobha, 161, 167.
Kanthi, 152.
Karanta or *Katta*, 190,
Kard-Khanjar, 164, *budga*, 164, function, 163.
Karmuka, 1, 40, 41, 56, 137.
Karna, 231.
Karpana, 56.
Karnink, 55.
Karsha, 57.
Kartikeya, 4, 98, with spear, 100.
Karwal sword, 142.
Kashmir foundry, 207, soldiers, 127.
Katar, 158, 160, 183, 184, function, 163, sheath, 163.
Kathian fort, 223.
Kati, 89.
Katori, 151.
Khande ka Pahul, 193.
Khandgiri, 255.
Khandavaprastha, 218.
Khang, 40, 83, 89, 142.
Khanjana, 152.
Khanjar, 4, 160, 163, 184, present, 160, price, 160, waist, 160.
Khapwa, 4, 160, 162, 163, 183, 196, function, 163, in *Ain-i-Akbari*, 164, price, 183, shape, 196.

Kharak, 245.

Kharjurvedha—an archery game, 77.

Khas gun, 171.

Khasi battle-axe, 264.

Khsepani, 145.

Khod or *Top*, 197.

Khogi, or saddle, 168.

Khsurapra arrow, 140.

Khud Dabalgah, 165.

Khsudra ship, 248.

Khukari, 5, 89, 90, 262, ***Ajanta***, 85, decorated, 125.

Khulani Phansi, 186.

Khusk Anjir or machine throwing stones, 244.

Kim Khab, 127, 196, 199.

Knife, 4, 21, 158, 163, 164, Indus, 21, hafting, 22, sharpening, 21, types (broad, curved, leaf-shaped, narrow, triangular), 21, with hollow-backed, 22, with recurved point, 22.

Knuckle-guard, 87, 151, 152, 156, 178, 182, 190, sword, 261, tribal, 261.

Kodanda, 1, 40, 41, 56, 137.

Koft, 131, 168, 171, 198, 199, *Koftkar*, 171.

Kohartarash, 58.

Kohlapur fort, 244.

Kona Samudran, 129, steel centre, 129.

Konark, 75, archery, 46, sword, 57, 85.

Korpi, 266.

Kosam fort, 227.

Kotal, 87, 171.

Kothis, 206.

Kotli Loharan foundary, 207.

Krich or Kirich, 190.

Kris, 4.

Kritrima fort, 216.

Kukadidar hilt, 153.

Kulang Guptidar, 178, 180.

Kulya, 225.

Kuman-i-Gurohah, 48.

Kumara tribe, 138, 142, 145, 265.

Kumargupta I, 74, 105, 142, II, 44.

Kumarsambhava, 43, 137, 139, 140, archery, 74.

Kunta or spear, 144.

Kurma Durga, 231.

Kurta Zira, 198.

Kushana, 101, fort, 227, javelin, 99, spear, 101, sword, 84, 101.

Kusinagar fort, 226.

L

Lac, 127, lacquered shield, 127.

Ladder, 223, fort, 239.

Lahariadar dagger, 4.

Laguda, 146.

Lahore foundry, 207, ornamentation, 132.

Lais arrow, 58.

Lance, 24, 38, 185, Ajanta, 112, decorated, 128, Sikh, 196, 197, with ivory shaft, 184.

Lanka fort, 217.

Late stone age tools, (awls, borers, burins, lunates, scrapers,) 10, sites (Barasimla, Kastara, Saliwar, Sakri), 10.

Later Vedic forts, 215.

Lance-shaped handaxe, 12, arrow-heads, 2, flakes, 9, spear, 261.

Laurel leaf-point, 9.

Lead balls, 207.

Leather belt, 21, 26, 122, 125, 153, 174, horse-trapping, 125, shield, 125, powder-flask, 125, scabbard, 125, shield, 125, waistbelt, 125.

Leather bow, 64, ladder, 243, strap, 150, 188, 198.

Leg-plate, 197.

Lhotas spear, 261.

Light artillery, 6, horse, 251, shield, 266.

Long, knives, 262, barrels, 188, 204, matchlock, 204, spear, 180.

Loopholes, 223, 227.

Lothal, 27, 247.

Lugs, 31.

Lunates, 10.

Lungee, 191.

M

Mace, 3, 16, 155, 156, 187, Ajanta, 112, bearer, 156, 186, Coins, (Gupta, Kadaphises, I, II, Lysias, Menander, Rajuvala, Vonones), 104, decoration, 155, 186, function, 104, head or ring stone, 18, Indus, 24, Kautilya, 104, *Mahabharata*, 104, Maratha, 186, Material (alabaster, cherty limestone, green coloured stone) 24, painting, 112, presentation, 156, studded with jewels, 156, with spiked knots, 104.

Machine, discharging arrow, 47, fort, 241, hurling stones, 244.

Madhyama ship, 248, *madhyamandir* ship, 248, weapons, 40.

Magazines, 174, Delhi, 202.

Mahabalipuram, 3, 46.

Mahabharata, 5, 116, 117, 132, 146, archery, 74, 77, fort, 217, 221, inscribed arrow, 141, mace, 104, navy, 248, origin of Delhi, 218, sword, 80.

Maha Govinda, 220.

Mahajanaka Jataka, fort, 219, *Mahakapi*, 78.

Maha Kirkorn, 260.

Mahapura, 216.

Maharana Pratap, 180.

Mahasarayantra, 57, 146.

Mahashilakanta, 244.

Mahi Durga, 217.

Mahishasurmardini, 3, 46, 67.

Mahonets ladder, 130.

Mahtab-i-alam, 170.

Maler tribe, 265.

Mallet, 150, 152.

Malloi, fort, 223, iron, 83.

Malvidyadhan, 77.

Manasara fort, 230, 232.

Mandala, 38, 67.

Mandalagra, 83.

Mane, 265.

Mang, 152, 153.

Manjaniq, 174, 245.

Manu Samhita, 217.

Maratha, 4, 181, *ankush*, 189, army, 191, axe, 189, *baghnakh*, (tiger-claw), 5, 189, *bhidchir*, 5, 181, characteristics of weapons, 181, compaign, 191, fleet, 255, fort, 244, *ghoonsa*, 5, horseman, 191, *jafar–takiya*, 189, *jamadhar*, 189, *Khadga*, 189, muzzle loading gun, 189, ship, (*Budgaro*, *Oloaka*, *Patella*), 254, slinger, 49, soldiers, 190, spear, 185, 189, sword, 89, 182, tactics, 188, *takiya–danda* 189, technique, 190, warfare, 181, war, 188, weapons, 5, 181.

Marches, 150.

Maroo, 4, 127, 179, 189, 190.

Massaga fort, 222.

Matchlock, 5, 49, 170, 174, 204, 207, damascening 174, decoration, 174, fort, 242, manufacture, 171, Maratha, 188, men, 242, Mughal, 171, raw material, 171, Sikh, 197, 203, 205, 206, size, 174, use, 181, weight, 171.

Material, *Adi archery*, 63, *aak*, 26, 155, *bhang*, 63, bronze, 22, 26, copper, 26, 33, cotton, 26, feathers, 63, hide, 63, horn, 26, 155, knives, 21, leather, 26, metal, 63, muslin, 197, rope, 26, shield, 170, silk, 197, steel, 155, tin, 26, wood, 26, 155, ivory, 155.

Matsya bheda, 77.

Matsari, 69.

Maurya, 181, administration, 223, fort, 223, navy, 249.

Maxims of archery, 72.

Measurement, 21.

Medial-rib, 19, 22, 31, 260.

Meeri and *Peeri*, 192.

Megasthenese, archery, 95, fort, 241.

Mehr-o-Mushtari, 117.

Melting of metals, 173.

Menander, 104, 106, 107.

Metal, 10, 36, 125, 127, 153, 177, 199, shield, 199, plate, 197.

Methods, examining sites, 215, stone age tools, 10, Kautilya, 240, sieges, 240.

Mian, 153.

Micoquian handaxe, 13.

Microliths, 10, burin, 17, meaning, 17, types, 17.

Middle stone age tools, 9, arrow-heads, 15.

Mid-rib, 26, 31.

Militant *Naga*, 239.

Minakar, 132.

Mirat-i Ahmadi, 48, 57.

Mirzapur-Cave paintings, 33, 111.

Misls, 192, *Misaldar*, 200.

Misra durga, 232.

Missiles, 24, 25, 181.

Mithun fort, 219.

Mithun hide, 262, 263, 266.

Moats, 220, 223, 227, 236, 240.

Modes of shooting, 96, 98, 141.

Mogra, 150, 151, 152.

Mohenjodaro, 20, 21, 22, 24, 26, 27, 33, 36, 247, 250.
Mohra, 168.
Moo, 265.
Mootha, 155.
Morass, 222.
Mortar, 6, 174, 206.
Mother of pearls, 127.
Moti Daudati sword, 153.
Moulding of weapons, 26.
Mountain fort, 224, gun, 205.
Mounted archery (elephant, horse, chariot), 74.
Mousterian technique, 12.
Movable ladder, 225, towers, 243.
Mrd Durga, 217.
Mudairat, 3.
Mudgar, 4.
Mud rampart, 220, rampart, 226, 227.
Mughal, 187, 206, 244, arms, 150, 174, arrow, 75, archer, 71, 78, boat, 253, *Boora*, 250, bow, 2, 63, 72, bowman, 75, cannon, 172, decoration, 125, fort, 244, hilt (crystal jade, metal, steel), 88, 151, painters, 116, Quivers, 59, matchlock, 171, sword, 81, 87, 88, warriors, 114.
Muhnal, 150.
Muktamukta weapons, 40, *mukta*, 40.
Muller, 16.
Mimda tribe, 258.
Muplah, 125.
Murva, 63, 136.
Musala, 146.
Musket or Musquet, 172, 197, 202, 204, 205, 207, 241, 244.
Musketeer or musketry, 50, 172, 185, 202.
Musketton, 5.
Muzzle-loading gun, 3, 47, 173, 188, 189.
Museum, Alwar, 124, 177, Batavian, Java, 45, British, London, 95, Central, Jaipur, 132, City Palace, Jaipur, 116, 120, 124, Dogra Art Gallery, Jammu, 155, National, New Delhi, 33, 89, 102, 116, 117, 118, 120, 123, 127, 132, 134, 153, 156, 158, 163, 164, 180, 182, Mathura, 101, Prince of Wales, Bombay, 116, 120, Red Fort, Delhi, 75, 154, State, Hyderabad, 154, State, Lucknow, 95, 100, Indian,Calcutta, 50, 58, 78, Zorkoe Sole collection, Russia 155, (also see Arms collection given separately).

N

Nadir Shah's sword, 89, inscribed *zihgir*, 50, battleaxe, 156.
Naft, 46.
Nagarayana, 244.
Nagarjuni hill caves, 45.
Nagarjunakonda, 42, fort, 229.
Nagas, 3, 90, 259, 260. 261, 267.
Nail, 1.
Nakhhas, 151.
Nakhoda, 253.
Nal, 31, 152.
Nalika, 146, *nalikastra*, 216.
Names of steel (*Bulat*, *Faulad*, *Ordinique*, *Wootz*), 128, sword, 155, sword manufacturer, 154.
Nand, 266.
Nao, 48.
Napier, 184, 196.
Naptha, 3.
Napunsaka, 56.
Narach, 1, 41, 63, 138, 140,
Nareh, 152.
Narrow, barb, 36, blade, 263.
Narsingh-mooth, 162, 164.
National Museum, 33, 58, 59, 64, 67, 86, 87, 89, 102, 174.
Navadhyaksha, 249.
Navak, 48.
Navataksheni, 251.
Navy, aerial, 248, Ajanta, 113, 147, 249, Alexander, 248, Asoka, 249, attack, 253, Babar, 253, Chola, 251, epigraphic evidence, 251, Gupta, 147, 241, Gujrat, 250, Indus, 26, Kanheri, 249, Kalidasa, 147, Kanhoji Angrey, 255, Mauryan, 249, on coins; 249, through the ages, 250, Sanchi, 249.
Nawak, 57.
NEFA, 5, 262.
Neja, 158, 180, function, 158.
Neolithic, 36, 62.
New stone age tools, 17.
Nischatra, 67.
Nihangnama, 87.
Nistrimsa, 83.
Nodule, 8, 11, 17.
Noose, coin, 106, length, 106.

Indira Gandhi Centre for the Arts

Nose-guard, 187, Sikh, 197.
Notches, 48, 127.
Nowwara, 253.
Nuktab, 58.
Nur Jahan's Sword, 87.

O

Oashqah, 612.
Odha, 151.
Oloaka, Ship, 254.
Omrah, 172.
Oranns tribe, 258.
Ordainique, 128.
Ore, 129.
Organ, 174.
Origin of Delhi, 218.
Orissan Sword, 81.
Ornamentation, 132.
Orra, 265.
Oval handaxe, 12, plate, 198, helmet, 165, point, 15.

P

Padded basket, 185, helmet, 166, material, (cotton, *kimkhab*, silk, velvet), 166.
Padmasana, 66.
Pahari, weapons, *khukari*, 5, *khadga*, 5, scissors-sword, 5, sickle, 5, *trisula*, 5, painting, 37, 118.
Paikan Kash, 58.
Painting, Ajanta, 39, armour, 169, artillery, 86, Avadh, 117, Bengal 117, Bikaner, 49, Guler, 49, Kishangadh, 49, Mughal, 49, 75, 81, 117, Rajasthan, 49, sword, 85, 117, war, 253, weapons, 111.
Pakhar, 165, *pakhara*, 168.
Pala, 3, 46, navy, 251, sword, 84.
Palace fort, 224, 225, 231, 238.
Palestine archery, 36, 62.
Palestine sword, 82.
Pamree, 191.
Pandrara iron, 83.
Pandiyan coins, 101, 105, dagger, 101, flag, 101, sword, 101, trident, 101.
Panhala fort, 239.
Panini, 99, fort, 219.
Panipat battles, I, 150, 253, III, 182, 185, 187.
Panja, 179.
Pano tribe, 265.
Papier mache decoration, 128.
Paraj, 151, 152.
Parapet, 6, 225.
Parasu, 3, 179.
Pardal sword, 87.
Parigha, 146, 230.
Parikha, 218, 219, 230, 232.
Parjayanka, 146.
Parts, of the hilt, 151, 152, sword, (*dumala*, *khanjana*, *mang*, *nal*, *peta*, *tonk*), 152.
Parvata fort, 216, 224, 230.
Paryupasana, 240.
Pasa, 194, material, (*bhanga*, flax, *munju* grass, hemp, *snayu*), 106, on coins, 106.
Paste for artillery, 67.
Patella ship, 254.
Patliputra, 216, 223.
Patrin, arrow, 138.
Patta, 67, 168, 182, 183.
Pattern in damascening, 130, welding, 121, 131, 133, 168.
Pearls, 132.
Pear-shaped handaxe, 12.
Pebbles, 7, 10, 11, 12, 13, 17, tools, 12.
Peeri and Meeri, 192.
Pellet, 24, 95.
Pen-knife blade, 18.
Percussion bulb, 9.
Perforation, archery, 36, mace-head, 24, design, 204, shield, 1.3.
Persia, 29, 36, 62, hilt, 90, mace, 187, sword, 195.
Peshquabj, 118, 196.
Peta, 152.
Phari, 125, 162.
Pharsa, 189.
Phool, 179, *katara*, 160, 163.
Pikes, 197.
Pinaka, 1, 40, 78.
Pipala, 152.
Pipal Fatila, 203.
Pirates, 249.
Pistol, 4, 174, 188, 202, 205.
Piyazi mace, 155.

Plume-holder, 187.

Point, 15, 152, barbed, 36, bifacial 15, types, 15.

Poisoned arrow, 43, 264, 265, *vajralep*, 63.

Polishing and grinding, 17, 36, 130, 132.

Polygonal flake, 12.

Pommel, 25, 88, 101, 121, 151, 154.

Portuguese navy, 252, 255.

Poros, 71, 248.

Positions of archery, 95.

Postern gateway, 229.

Post-Gupta weapons, 46.

Patella Ship, 250.

Pottery, 26, models, 26, balls, 25.

Pouches, 174.

Powder-flask, 174, decorated, 124, horn, 174, 197, iron, 125, leather, 127, velvet, 127.

Prabhu fort, 231.

Practising arrow, 58.

Pragandi fort, 218.

Prakara, 218, 219, 230.

Prasa, 40, 143.

Prastaka, 139.

Pratyalidh, 66, 67.

Precious stone, 127.

Pre-historic arrow-heads, 37, pre-Mauryan, 41, fort, 220.

Preparation, sword blade, 130, steel-billet, 120.

Presentation, 120.

Price, 156.

Prik-axe, 189.

Priming-horn or powder-flask, 127, 174, 197, 203.

Prithviraj Chawhan, 47, 49, 67, 78.

Projectiles, 3, 188.

Pugree, 191.

Pulling of the string, 70, 71.

Punch-marked coins, 37, 39, 95.

Pur, 214, 215.

Purana, 216, 217.

Purandara, 214.

Purargata, 230.

Purusha, 56.

Pustakhar, 179.

Putala, 151, 152.

Pyjama Zira, 198.

Q

Qabchah, 165.

Qabzah, 150.

Qalandar, 58.

Qamchi-Kard, 163.

Qasarah, 174.

Queen wearing a helmet, 107.

Quillon, 152, Ajanta, 85, on coins, 101, 102, sword, 102, quilted armour, 169, jacket, 165, horse-armour, 168.

Quiver, 42, 45, 46, 47, 49, 50, 58, 74, 75, 141, 178, 190, *Adi*, 64, Ajanta, 60, 98, 111, 112, *Ain-i-Akbari*, 60, coin, 95, 98, decoration, 125, enamelled, 48, Jaina painting, 60, jewelled, 48, material, 59, leather, 125, Mughal, 60, orissan ivory, 60, Persian, 57, *Khasa*, 48, use, 47, with golden belt, 47, tribal, 60, 265, *qirban*, 58.

Quoit, 5, 196, *chakra*, 5.

R

Raft, 247.

Raghu, 43, 67, 138, 140, 141, 230.

Raghuvamsa, 43, 100, 139, 140, 145, 146, 147.

Raid, 6.

Rajagriha fort, 220, 221, 222, 226.

Raja Karn Ka Tila, 34.

Rajasthan, shield, 127, weapons, 39.

Rajput, 4, 177, arms, 177, decoration, 125, fort, 244, sword, 115, warrior, 115, weapons, 125.

Rakkalah, 174.

Ramjanaki, 174.

Ramayana, 40, 41, 49, 132, archery, 74, 77, fort, 217, 244, sword, 83.

Rampart, 220, 222, 225, 227, 231, 236, 239.

Ranak, 170.

Rangin gun, 171.

Ranjit Singh, 50, 89, 192, 195, 196, 199, 200, 201, 202, 203, 205.

Rani Gumpha cave, 67.

Rapier, 182.

Rastrakuta, 181.

Ratha durga, 232.

Rathamusala, 244.

Ratna Prakara, 218.

Razor, 26, 140, 194.
Reduction by stravation, 243.
Reed arrow, 125.
Removing of carbon, 130.
Rengma, 263, 264.
Repairing of forts, 239.
Retouch, 14.
Revolver, 188.
Rhinoceros, 33, 101, 197.
Ribbon flakes, 26.
Ridgeon on blade, 4.
Rifle, 204.
Rigveda, 36, 38, 40, fort, 214, hundred walls, 215, navy, 248, *Samhita*, 40.
Ringed armour, 11, 198, stone, 18.
Risala-i-tir-o-Kaman, 48, 71.
Ritusamhara, 43.
Rock, crystal, 127, 196, painting, 111, shelters, 10.
Roda, 155.
Rope ladders, 243.
Roughly-shaped arrow-heads, 2, 43.
Round helmet, 165, shield, 266.
Royal insignia, 155, roads, 225.
Rubies, 127, 132.
Rudra, 38, 39.
Rudirakosha, 225.
Ruru Jataka, 67.

U

Udaka durga, 217, 219.
Udaigiri, 2, 181.
Udaipuri, 151.
Udanah, 161.
Udayana, 67, archery, 77.
Ujjain, 227, coins, 78, spear, 98.
Ummagga, 220.
Underground tunnels, 238, staircase, 239.
Unifacial choppers, 12, pebble tools, 13, sword, 19.
Unstretched bow, 59, 177.
Upanishada, 216, fort, 216.
Upjab, 240.
Upper Paleothic archery, 36.
Urchhah-siege, 243.
Urdhva Sandhan, 67.
Urvila fort, 226.
Use of elephant, 244, siege, 244.
Ustad Daod, 88.
Ustak, 168.
Uzbeg Kard, 164.

V

'V' shaped arrow, 38.
Vaisakh, 66, 67.
Valmiki *Ramayana*, 40.
Valinimukha, 232.
Vaisali fort, 227.
Vajra, 106, 146, *Vajrin*, 146.
Vajralep, 63.
Vajramusthi, 67.
Value, gun, 174, sword, 262.
Vaman, 240.
Vandurga, 216, 217, 224, 230, 231.
Vapralaya, 230.
Varaha hill, 221.
Varaha Samhita, 77.
Varuna, 40.
Vapra, 216.
Varnishing, 170.
Vastu Shastra, 217, fort, 217.
Vatsakarna, 66, 70, 71.
Veda, 1, archery, 77, arrow types, (*aramukha, batsadanta, bhalla, dvibhalla, gopuchha, kakatunda, karnik, khsurapra, Suchimukh*), 55, arrow, 37, 55. fort, 214.
Velvet, bullet-case, 127, coat of mail, 127, powder-flask, 127, scabbard. 122, 127.
Venu, 1, 41, 138.
Vicharuval, 5.
Vijaya sword, 83.
Vikata, 67, 95.
Virasvarga, 148.
Vishampada, 66, 67.
Vishayan, 83.
Vishikha, 140.
Vishnu, 1, 3, 106, *Purana*, 40, Trivikrama, 46.
Vyaya, bharata, 71, *kausika*, 71, *skanda*, 71, *satvika*, 71.
Vatsakarna, 71.
Vyuha, 230.

W

Waist, band, 160, belt, 125, 154, *khanjar*, 160, plate, 197, sword, 87.

Walking sticks, 164, 190.

War, 44, Ajanta, 113, elephants, 150, helmet, 266, instruments, 6, horses, 46, 75, 113, material, 238, scene, 120, sport, 258, vessel, 253.

Warrior, 42, 46, 84, 102, 127, 128, 157, 257, 263.

Watch-tower, 216, 218, 220, 222, 239.

Waterered steel, 87, fort, 224, moat, 220, supply, 218, 225, 239.

Ways of gripping bow, *changal-i-baz*, 72, *muharraf*, 72, *murabba*, 72.

Wazirabad foundary, 207.

Weapons, arrow, 111, bow, 111, for smashing, 3, from *Ain-i-Akbari*, 162, on coin, 84, 93, 94, in painting, 85, 111, 182, on sculptures, 105, spear, 111, with designs, 120, tribal, 257, 262, 264, 265, thrusting, 3.

Wedge, 17.

Weight of the sword, 19.

Witchcraft with arrow, 78.

Wooden, decoration, 127, *Dao*, 263, gun-carriage, 125, handle, 125, *howdah*, 125, *shisham*, 125, teak, 262, tribal, 262, rampart, 223, scabbard, 122, spear, 23, wall, 216, *yali*, 22.

Wootz, 128.

Y

Yajna, 193.

Yajurveda, 39, 40, 216.

Yakbandi sword, 87.

Yak-hair, 260.

Yali wood, 22.

Yamatyarjuna-archery game, 77.

Yanthong Dao, 263.

Yantramukta weapons, 40.

Yare vafadar, 89.

Yaudheya, coin, 98, spear, 98, spearman, 98.

Yengmo, 264.

Yuddha Durga, 231.

Yukti Kalpataru, navy, 248.

Yupa, 40.

Yusuf Zulekha, 117.

Z

Zafar-nama, 47, sword, 86.

Zafar Takiya, 89, 125.

Zagnol or *Jaghnol*, 4, 162, decorated, 125 mineral, 130.

Zamburak, 174, 201, 202, 207.

Zamzama, 200, 206.

Zaripatta, 128.

Zar-nishan. 131, 168.

Zerband 168.

Zeus, 99, thunderbolt, 100, 106.

Zich-i-Jadid-e-Miraji-Tazak, 116.

Zih, 155.

Zihgir, 50, 64, 155.

Zirih, 161, 166.

Zira, 198, *bakhtar*, 6, *kullah*, 198.

— o —

I.G N.C.A. LIB.
86673
Deptt of Arts
13.3.86
GOVT. OF INDIA

From the Foreword

Wars of today are "Total Wars." It is not only the soldier, sailor and airman who fight for the defence of one's country on the battlefields, but every one behind – be it in a factory or on a farm or driving a bus or a train or doing any such work, is also participating in the conduct of wars. In the last War, it was estimated that for every soldier in the front line at least forty people were behind him, not standing behind him, but in the back areas, providing him, his needs of equipment, weapons, ammunition, food, medical facilities, postal services and so on and so forth. So, today, it is imperative that every citizen of the land, as far as possible, should be conversant with the evolution of weapons and arms and their development and with the mechanics of warfare to see how each one plays his/her part in the successful conducting of military operations.

This very fine book "STUDIES IN INDIAN WEAPONS AND WARFARE" by Shri G.N. Pant, is the result of the intensive research carried out by the author with particular reference to weapons and arms and the study of their uses in wars, in our country, from the Vedic periods. He has taken considerable amount of trouble to "dig out" from a large number of important and informative books of reference and other sources. I have read this book with gcat interest with added profit to my knowledge of military matters of old. It is full of educative details on arms and weapons and warfare from ancient days. I hope it will be read widely by every literate Indian and I hope too that every library throughout India will have at least one copy of it as a book of reference for all.

General K. M. Cariappa.

ARMY EDUCATIONAL STORES
NEW DELHI-5